Hospital Infection Control

FD Dastur*, Ajita Mehta**, Camilla Rodrigues***

The health care scene is changing in India. Today two thirds of the population seek medical care in the private sector. Corporate hospitals are increasing in number as are those built with NRI funds. Medical tourism is being vigorously pursued in some areas. At the same time foreign insurance companies and Third Party Administrators (TPA’s) are entering the arena. In future it is likely that hospitals will only receive reimbursement for DRGs (diagnosis related groups e.g. pneumonia, hernia etc.) and not be payed for disease complications such as hospital acquired infections. This will provide strong motivation for hospital administrators to promote infection control programmes which are already mandatory abroad for hospitals seeking accreditation.2

Do Infection Control Programmes Work?

In the 1970’s in the United States the Centres for Disease Control and Prevention (CDC) began a nationwide “Study of the efficacy of nosocomial infection control - the SENIC project”. The project involved 638 hospitals nationwide. After a decade the study established that the broad overall activity of infection control programmes predicted infection rates.5 The most important predictors in decreasing order of importance were intensity of surveillance, intensity of control measures, an infection control practitioner/sister for every 250 beds, presence of a trained infectious disease specialist on the staff and provision of SSI (surgical site infection) rates to surgeons in order to influence their behaviour. Hospitals having such programmes demonstrated a 33% reduction in hospital infections compared to hospitals without any programme.4 One hospital having an effective programme calculated yearly cost saving in excess of 2 million dollars. Thus substantial gains are to be expected for both doctors and administrators by supporting infection control programmes.5

The Infection Control Committee

Prevention of hospital infections is essentially a big policing operation. First one has to gather people to perform this function, namely the infection control committee.6 The core committee consists of a physician, a microbiologist and a surgeon, with representatives from operation theatres, CSSD and ICUs. Inputs are also required at times from others in housekeeping, laundry, food services and engineering who work as a team to maintain the hygiene and cleanliness of any institution. For committee members the job of infection control is added on to their other commitments, so that a person working full time is required to coordinate activities, - this is usually the infection control sister.7 Finally the committee requires its recommendations to be implemented and so must have access to administrative heads of the institution.

Functions of the Committee

The committee performs three principal functions. The first is to gather data. Each institution needs to know the microflora of its high risk areas such as operating theatres, adult and neonatal ICUs, dialysis units and oncology services. A good microbiology laboratory is essential to isolate organisms, to plot antibiotic resistance patterns and to indicate to clinicians trends and changes in hospital flora.8 The laboratory is also best suited to identify outbreaks (3 or more cases of infection with the same organism and antibiogram) and to alert clinicians accordingly.

The second function is to carry out surveillance.9 Whole hospital surveillance is impractical and largely meaningless. Most hospitals target surveillance at infections that (1) are associated with a high level of morbidity (e.g. ICU related infections and ventilator pneumonia); (2) are costly such as post cardiac surgery wound infections; (3) are difficult to treat such as infections due to antibiotic resistant bacteria; (4) are potentially preventable such as vascular access related infections.10 Having established the baseline rates of infection for any procedure, surveillance is able to detect sudden increases in these rates so that remedial steps can immediately be taken. The method thus detects breakdowns in aseptic practices or sudden outbreaks of infection.11 Surveillance is a powerful tool in infection control but is time consuming and expensive. Spot surveillance is sometimes a quicker and cheaper approach; for example how many people in an ICU examine patients without first washing hands or using an alcohol rub solution.12,13

The third function of the committee is to enforce good infection control practices. For this certain concepts must be ingrained.14 Nosocomial pathogens have reservoirs and are transmitted by predictable routes to susceptible people.
hosts. Thus hospital tap water in India may be contaminated with *E coli* or *Legionella* and cause infections. Operating theatre air must be kept pathogen-free with the aid of 15 air changes per hour and the use of bacterial filters. Sometimes members of the operating team are chronic shedders of *staphylococci* either from the nose or perineum, who because of their proximity to the surgical site can initiate wound infection. In the wards and ICUs cross infection is a bigger threat. Transfer of organisms on the hands of health care workers from one patient to another makes hand washing the single most important infection control practice. At other times improperly diluted disinfectant solutions can harbour pseudomonas organisms and cause outbreaks of infection.

Hospital infections are increased by invasive devices and there must be a conscious effort to remove these at the earliest opportunity. Bacteremias, pneumonias, urinary tract infections line infections and surgical site infections are the major causes of morbidity and mortality. In USA 2 million patients suffer from hospital infections each year of whom 88,000 die. The estimated cost is 4.5 billion dollars. In India this cost is more than what the Government spends on total health care. Any hospital can be expected to record a 5-10 per cent incidence of hospital acquired infections even with an active infection control programme because of today’s aggressive approach to sick patients.

**Hospital Infection Control - The Broader View**

“The first requirement of a hospital is that it should do the sick no harm” was Florence Nightingale’s dictum. Today this has been extended to incorporate the health and safety of hospital employees. Their needs have been highlighted by the HIV and SARS epidemics. The former gave rise to the concept of Universal Precautions (now Standard Precautions) for all diseases that are infectious through blood or body fluids. The latter which affected a disproportionalately large number of health care workers demanded strict isolation of victims in negative air pressure rooms, strict respiratory precautions for attendant health workers, and quarantine for any contact health care worker developing a fever. That level of discipline has yet to be achieved in India.

Hospital waste disposal is also a growing issue. In Mumbai out of 6000 tonnes of waste generated daily, only 40 tonnes comes from hospitals. But the problem is that hospitals are not clearly segregating waste into infectious and non-infectious and are therefore contaminating the entire quantum of solid waste. The real risk of infection comes from ‘sharps’ which transmit HIV, hepatitis B and C viruses. Waste should be handled as little as possible but there is the social problem of rag pickers who remove syringes, needles and the like and recycle these items without sterilization. Hospitals that incinerate waste containing plastics made from organochlorines, release toxic dioxin and furan gases into the environment. Both matters are of concern for public health.

The reuse of expensive ‘disposable’ items merits consideration in a resource poor country like India. Cardiological societies for instance have made guidelines for the reuse of cardiac catheters after thorough cleaning and sterilization in order to benefit poor patients. The infection risk appears to be minimal if reuse is limited to three occasions.

Hospital Infection Control needs a multifaceted approach. Moreover the reader will appreciate that infection control is a never ending struggle as medicine become more invasive and the proportion of ageing and immunocompromised patients in our population continues to increase.

**REFERENCES**

16. Weinstein RA. Hospital acquired infection - In Harrison’s principles of internal medicine Eds Kasper Braunwald Fauci
Announcement

Award Sessions

1. Dr. DP Basu Young Award in Cardiology.
2. E Merck Award.
3. Dr. JN Berry Memorial Award and
4. Dr. MJ Shah Memorial Award in Tropical Medicine

There will be four award sessions at the 2006 Annual Conference of API at Patna. The rules and regulations of these awards are as under.

1. Papers that are accepted for presentation in the Award Session at the Annual Conference will be divided subject-wise into four groups.

   Group I  Cardiology  DP Basu Young Award
   Group II  Chest Diseases  E Merck Award
   Group III Other Specialities  JN Berry Memorial Award
   Group IV  Tropical Medicine  MJ Shah Memorial Award

   The Award of Dr. JN Berry Memorial Award and E Merck Award are given in alternate years in Group II and III papers. At the 2006 Annual Conference at Patna, Dr. JN Berry Memorial Award will be for "Other Specialities" and E Merck Award for "Chest Diseases". Dr. DP Basu Young Award will be for "Cardiology" and Dr. MJ Shah Memorial Award for "Tropical Medicine".

2. The competitor must be the first author of the paper submitted for presentation at the API sessions of the Annual Conference. A testimonial must be submitted from the head of the institution that the major work has been done by the competitor. Papers which are previously presented or published will not be considered. The competitor should also give a written pledge stating that the work has not been presented or published before. He should be a member of API.

3. Dr. JN Berry Memorial and DP Basu Young Awards are worth Rs. 1000/- each E Merck Award Rs. 2000/- and Dr. MJ Shah Memorial Award is worth Rs. 2500/-

4. The upper age limit of the competitor is 40 years.

5. The decision will be taken by a panel of judges appointed by the Governing Body of API.

6. The candidate must apply for the award and full manuscript of the paper will have to be submitted. The paper will be presented in separate award session.

7. Eight copies of full manuscript will have to be submitted Dr. BK Sahay, President - Elect and Chairman Scientific Committee, APICON 2006, ”My Nest” H. No. 6-3-852/A, Ameerpet, Hyderabad - 500 016 by 31st July, 2005. One copy of the paper should be sent to Dr. Sandhya Kamath, Hon. General Secretary of API Unit No. 6 and 7, Turf Estate, Opp. Shakti Mill Compound, Off. Dr. E Moses Road, Near Mahalaxmi Station West, Mumbai 400 011. Tel. 022-5666 3224; Fax : 2492 0263.

8. The decision of the panel of judges will be final and binding to all concerned.

Prestigious Awards of API

2. Distinguished Member (2006)