

# COMPARATIVE ANALYSIS OF HOSPITAL SERVICES FOR THE MANAGEMENT OF INFECTIOUS DISEASES

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## SYNOPSIS

To better understand the different services available for the management of infectious diseases, visits were made to several centres in North America and the U.K. The systems under which these services operate were also analysed to see if they can successfully bridge the gap in communication that often exist between the microbiology laboratory and the wards. Many institutions now have their own infectious diseases unit (IDU) and these units may be directly involved in patient care with their own infectious diseases wards or they may only play a consultative role as found in centres in North America. Since the microbiology laboratory is generally a separate department, the institution of the infectious diseases unit will not necessarily result in better communication between the laboratory and the wards. It will be an advantage for an institution to merge the microbiology laboratory and the IDU into one department. This will help to ensure better communication between the microbiologist and the infectious diseases specialist and also encourage the utilization of these integrated facilities for the balance training of these specialties. In centres with no infectious diseases unit, various attempts have been made by microbiologists to participate in the clinical management of patients. Such attempts should be encouraged, as a successful liaison between the laboratory and the wards will lead to better patient care and also more effective utilization of the laboratory.

## INTRODUCTION

The proper management of infectious diseases (ID) requires co-ordinated effort by the ward doctors and the microbiologists. Traditionally, however, the two parties work in relative isolation(1, 2), the communication between them being largely confined to requests from the ward for microbiological investigations, and, reporting of results by the laboratory. There was little input by the clinicians in determining the course of laboratory investigations and by microbiologists on management of infectious diseases. This system worked reasonably well at times when infectious diseases were largely caused by relatively few organisms, the pathogenic properties of which are well established and when there were only a few antibiotics available. The number of new antibiotics has since increased substantially and will continue to increase in the future. The advancement of medicine has resulted also in an ever increasing number of patients whose underlying conditions predispose them to opportunistic infections by organisms which are otherwise harmless. Some of these infections will require more elaborate laboratory investigations to establish its aetiology. It is essential, in such

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instances, that microbiologists have the relevant clinical information in order to determine the most appropriate course of investigation. The significance of laboratory findings will depend on the clinical condition of the patients and therefore cannot be interpreted in isolation (1, 3). A coordinated effort by clinical and laboratory staff is also needed to control the spread of such infections in the hospital. In the light of the above, it is obvious that the traditional system is no longer adequate.

To meet the requirements arising from this changing pattern of infectious diseases, certain institutes have established infectious diseases units or divisions. These units are staffed by infectious disease specialists (ID specialist) who are physicians, specialising in the clinical care of infectious diseases and, together with other supporting hospital staff, they are able to provide a good standard of patient care. In other institute which do not have a separate infectious disease unit, there have been various attempts made by the microbiologists to become involved in the management of infectious diseases. To understand the mechanism of operation of these systems, I have visited institutes in the U.K. and North America. In the following, I provide brief descriptions on the operation of representative systems and evaluate these systems in terms of the extent to which clinical and laboratory activities are coordinated and the level of patient care provided as a result of these efforts.

#### **INFECTIOUS DISEASES UNIT**

A number of large hospitals in U.K. have an infectious diseases unit (IDU) or department with their own wards headed by ID specialists (A variation of this system is to have an ID hospital with links to several general hospitals). Patients in the ID wards may be admitted directly from the community but the ID specialist is also consulted by the other units of the hospital and patients may be transferred to the ID wards from these units. In those centres which I visited, the microbiology laboratory which provides services for the entire hospital, is generally separate from the IDU. Having an IDU with their own specialised doctors and nurses will naturally lead to better professional care and isolation of patients with infectious diseases. However it is observed that with an ID specialist available in the hospital, most consultations and infection problems are directed to him. Thus, the institution of IDU in many instances, may tend to further isolate the laboratory from the wards rather than bringing them closer. As the microbiology laboratory and the IDU in most instances operate as separate departments, the interaction between them can be largely restricted to specimens' flow as in the traditional system. This is unfortunate, because ID specialists usually have no formal training in clinical microbiology and hence, lack a comprehensive appreciation of the laboratory aspects of infectious diseases, an area which the microbiologist may be of help, if there is more dialogue between them. Another disadvantage is that, being separated, the IDU will be less able to fully utilize the laboratory in its training programme for ID specialists.

#### **CONSULTATIVE INFECTIOUS DISEASES UNIT**

Infectious diseases is a recognized clinical specialty in the U.S. with their own specialty board in existence for over 10 years and in many hospitals, separate units or divisions of infectious diseases have been established. These divisions usually do not have their own wards, being not involved directly in patient care but they only provide consultations on the management of infectious disease to the doctors in the other departments. The option is always opened for these ID specialists to manage patients directly, as they retain admission rights to the beds in the

hospital, but because of their accepted consultative role, such rights are seldom used. In one centre which I visited, the routine hospital duties of the division which include consultative rounds, outpatient clinics and participation in hospital infection control are carried out by a "consulting group" which consists of one or two "fellows" who are currently undergoing specialist training in infectious diseases, several residents in internal medicine and some medical students. The senior clinical staff members who are board certified ID specialists, being actively engaged in research and other academic pursuance, take turns to supervise this group. There is also a team of infection control nurses(4) assisting the division in the work of hospital infection control and as their work has been well described by Wenzell(5), it will not be further elaborated here.

When patients are referred to the division from the other departments, a junior member of the group will first see the patient and re-clerk the case, giving special attention to any infectious condition. The entire group with the senior staff on duty will then do a consultative round later in the day, when they will visit all those wards in the hospital with a consulted case. All cases will be discussed by the bed-side and the conclusions with the group's recommendations will be related directly to the ward doctors. These cases will subsequently be seen daily until the infectious condition is over. The consulting group will keep the ward doctors informed of any new insights or recommendations on the case. Although the recommendations of the groups are readily accepted, the final decision on the treatment always lies with the ward doctors who are directly looking after the patient.

When a patient is referred to the division from the community, he will first be seen at the out-patient by the ID specialist and if admission is necessary, they are usually admitted to one of the beds of the other departments. The patient will then be under the direct care of doctors in that department while the ID specialist will continue to see the patient as a consulted case, as described above.

As can be seen, patients in this institute benefit from the specialist advice provided by the ID division. Its activities also provide at the same time an excellent training for its junior staff members and students attached to it. However, in an institution where the supply of doctors are more limited, it may be difficult to allocate such a substantial number of doctors for consultative work alone without the responsibility of directly caring for the patients in the wards. Another observation is that the microbiology laboratory in this institute, as in most centres, operates as a separate unit under a different department. The potential weakness of such an arrangement is already described under "Infectious Diseases Unit".

#### **MICROBIOLOGY DEPARTMENT WITH CLINICAL PARTICIPATION**

In hospitals which do not have a separate infectious diseases unit, there have been various attempts by microbiologists to participate in the management of ID. They are consulted by individual physicians on matters related to ID, involved in setting antibiotic policies, engaged in the work of infection control committees and are often responsible for the supervision of the infection control nurse(6). It is obviously not possible that, in addition, they also see all patients with a possible infection problem. Hence, in some institutes, microbiologists see only those patients who are currently receiving antibiotics after receiving the list of these patients from the pharmacist. Whereas, in others, microbiologists participate in "Fever" or "Antibiotic" rounds where patients with infectious problems have been preselected for further pursuance. Such rounds however are only possible if the ward doctors are interested enough to spare the time for it and open enough

to accept the input of the microbiologist.

In one institute which I visited, a medical officer appointed to the Department of Microbiology is assigned the responsibility of liaison with the ward. He sees all patients with a serious infection problem, usually those who give a positive blood or CSF culture result. Clinical history of each patient is then presented in a daily meeting to a team of senior microbiologists. Together with current laboratory findings, the group then decides on an appropriate course of further laboratory investigations and recommends a course of treatment for all the patients discussed. The recommendations by the group is either related directly or via the medical officer to the doctors in the wards. Thus, the microbiologists are able to become involved in a comprehensive manner in the management of infectious diseases in the hospital and coordinate the efforts by the laboratory and the wards. A possible weakness of this system is its reliance on a relative junior staff member who due to a lack of experience might not be aware of some of the intricacies of infectious diseases. It might also be more difficult for him to convince his clinical colleagues as regards what is the most appropriate treatment.

In another institution, the senior microbiologist is the one who does daily rounds. Besides seeing consulted cases referred to him from the wards, he also sees all cases under isolation for infectious diseases and also cases with a problematic isolate from specimens sent to the laboratory. To select these problematic isolates, all specimens are screen early in the morning before the microbiologist's daily rounds. Naturally with a senior person, these rounds are more effective than that of a medical officer. However as the senior microbiologist often has other responsibilities, he may find it difficult to maintain these rounds on a regular basis.

The establishment of liaison between the laboratory and the wards will require an effort on the part of the microbiologist to be more involved clinically in the wards, otherwise the traditional system will be adopted by default. This may not be easy because the traditional system had made a deep impression in the minds of many doctors and he may not understand the reason for the clinical involvement of the microbiologist. Furthermore, this clinical involvement may not be possible unless there are sufficient clinically qualified microbiologists in the laboratory and this emphasizes the importance of recruiting more clinicians into the field of clinical microbiology.

## CONCLUSION

For the proper management of infectious diseases, we need to bridge the gap between the wards and the laboratory. The existence of an IDU, as was pointed out, need not necessarily bring them closer unless frequent dialogue is established between microbiologists and ID

specialists. Where an IDU do not exist, the gap may be bridged by more frequent involvement of the microbiologist in the clinical management of infectious problems. This is only possible if the microbiologist has enough clinical training to participate in the activities in the wards and also on the part of clinicians, a willingness to accept his input and to optimise his clinical presence. Attempts have been made in this direction but more should be encouraged.

In most of the centres visited, the laboratory and the wards are in separate departments and this is felt to contribute to the gap in communication between them. For those institutions with an IDU, they will stand to gain if they can merge the IDU and the microbiology laboratory as one department. This is not only logical, as the laboratory and clinical aspects in the management of infectious diseases are really carried out for the same patient, but it will also encourage more communication between the microbiologists and the ID specialists. It will be reasonable to expect them to do rounds together as they are in the same department and also these integrated facilities can be utilised to provide a more balanced training programme for both the microbiologist and the ID specialist. Such a department will also help to offset the difficulty in some centres to attract medical graduates to clinical microbiology due to the lack of clinical bed-side involvement. With the ID wards in the same department, microbiologists should find it more conducive to involve themselves in the clinical aspect of infectious diseases and also to have the satisfaction of seeing the results of their laboratory work put to optimal use. Sir Howie once fretted that clinicians and microbiologists should get together but obviously they don't(1). Perhaps they finally will if they are under the same roof.

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