

A ROLE FOR AN INFECTIOUS DISEASES PHYSICIAN

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INTRODUCTION

The management of infection embraces a wide range of subjects ranging from internal medicine; clinical medical microbiology including virology; infectious diseases; travel and tropical medicine; applied immunology and clinical epidemiology. Traditionally the speciality of infectious diseases in the UK, also previously called communicable diseases, has evolved from the care provided by physicians who specialised in caring for febrile patients based usually in fever hospitals established outside the major cities in the UK.¹ These specialists increasingly found themselves working in isolation hospitals cut off from the mainstream of medicine. Often the provision of essential support services for managing serious infection such as imaging, ICU, CCU and, often full microbiology services, were not on the same site as these isolation hospitals. The last decade has seen the increasing integration of such isolation units within District General (DGH) and Teaching Hospitals. This was partly in recognition of several reports indicating the need to improve infectious disease facilities.^{2,3,4} One such report³ advocated strongly the need to provide sufficient isolation beds with adequate facilities for each region. Many infectious disease (ID) units have often functioned with high bed capacity but poor occupancy (D. Nathwani, personal communication). The main reason for this has been the gradual decline in many communicable diseases due to vaccination, better living conditions and prompt antibiotic treatment. The poor bed occupancy had often been justified by the excuse 'to have beds available in case another infection epidemic comes along'. The fact that AIDS, a major modern epidemic, failed to fill these beds is a testimony to this rather unrealistic argument for keeping so many unoccupied beds. Furthermore, the current health culture of reduction in hospital beds and of cost efficiency makes this practice unsustainable. The predominant in-patient workload of ID units is to manage patients with communicable diseases such as food poisoning, HIV-related opportunist diseases, presumed or proven meningitis, viral exanthemas, skin and soft tissue infections, a handful of patients with malaria and other travel-related infections.⁵ Many of these ID units maintain reasonable bed occupancy by admitting non-communicable infections or general medicine admissions.⁵ The latter is confirmed by our finding that on average a third of our occupied beds are with a primary general medical diagnosis. In light of the emergence of tuberculosis, especially in the HIV population, the rising

tide, diversity and severity of gastroenteritis (e.g. *E. coli* 0157 infection), the spread of infections due to multi-resistant organisms, the spectre of highly contagious imported infections, amongst many,⁶ one has to acknowledge the continuing and essential requirement of in-patient isolation beds.⁴ These must be provided and staffed by appropriately-trained medical and nursing staff.⁷ However, the presence of such ID units is mainly in a few regional centres but there has been little expansion in each health district as recommended by a UK Joint Royal Colleges Report.⁸ This partly stems from the uncertainty amongst managers and many clinicians as to what an infection general physician based in a non 'system' speciality can offer and what an infection service can provide for an organisation, particularly a DGH, or a region.⁹ Additionally, one must also question their cost-effectiveness compared to other internists. This article aims to 1) provide a model of infectious disease care in the UK, particularly with a view to development in the District General Hospital setting and 2) illustrate the potential for clinical and economic benefits of investing in clinical infection services by way of describing the development of our service in Dundee.

MODEL FOR ID SERVICES

It is my opinion that ideally a modern ID physician should adopt a much broader remit of managing infection. The in-patient bed numbers need to be significantly streamlined but without compromising the capacity to meet the needs of a region or hospital for isolation beds. Modern ID physicians need to move away from the concept of providing infection care purely based around their in-patient beds and solicited consultations in another part of the hospital. First, ID units and services need to be integrated into the mainstream of hospital internal medicine (or some other similar clinical liaison). Secondly, they need to expand their role and provide a range of services aimed at fulfilling the infection needs of the community and institution they serve. These potential needs are many and diverse. They should be provided usually in conjunction and close collaboration with the clinical microbiologists and other colleagues (e.g. managing chronic hepatitis C infection jointly with the hepatologists). I believe that, in addition to in-patient isolation care, ID services could include provision of solicited and unsolicited consultations (e.g. for patients with bacteraemia) to in-patients and out-patients in all sectors of the hospital (e.g. internal medicine, ICU, surgery, oncology, haematology),^{10,11} travel advice and immunisation clinics for the community,¹²⁻¹⁴ in-patient antibiotic review,¹⁵⁻¹⁸ HIV care,¹⁹ infection guideline and critical care pathway development, dissemination, implementation and audit,²⁰⁻²² management of needle stick injuries in health care workers (in collaboration with the occupational health service) from proven HIV or 'high-risk' sources requiring commencement of anti-retroviral prophylaxis,²³ out-patient and home parenteral antibiotic therapy programmes (OHPAT),²⁴ and

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urgent (within 24 hours) consultation availability.

EXPERIENCE OF DEVELOPING ID SERVICES IN DUNDEE
 In Dundee the clinical ID service, in close co-operation with the Department of Medical Microbiology, has developed over a six-year period to provide what I believe to be such a modern infection service. This service serves a large (> 1,000 bedded) teaching hospital with a catchment population of around 400,000 patients. The ID service has 2WTE physicians and 1WTE Specialist Grade Registrar. The in-patient unit has 22 beds, admits on average 1,200 patients and sees about 1,800 out-patients (excluding travel clinic clients) annually.

In January of 1999 one of the ID physicians (DN) kept a diary of all his ID in-patient, out-patient, consultations (including curbside or informal consults)²⁵ and telephone advice workload. This paper excludes the substantial HIV workload (an important area for most ID services) of one of the physicians who has a special interest in this area and the management of some orthopaedic bone infections, an interest of one of the other ID physicians. The aim of this diary is to illustrate (Tables 1, 2 and 3) the typical and atypical (in the cases of the outbreak of cutaneous leishmania [*L. brazilienses*] in 12 marines returning from duty in Belize) workload of a modern ID UK clinician with a view to highlighting the diverse nature of the job, and the positive impact our service has on many aspects of infection care in our institution. The paper excludes the author's workload in internal medicine, administrative, teaching, CME and research duties.

BENEFITS OF CLINICAL INFECTIOUS DISEASES SERVICE

It is my hope that the experience described in this paper highlights and bring to the attention of other clinicians and managers the range of skills and services that a modern clinical ID service can provide. In addition, outcome research can provide some data that support the role of ID sub-specialists although the limitations of collecting and evaluating such comparative performance data retrospectively or prospectively have been clearly highlighted previously.⁹

There is persuasive evidence that in a number of activities the presence of an ID service has a beneficial impact on various measures of clinical and economic outcome. One key area is the reduction in antibiotic prescribing costs, a major concern in hospitals and the community.^{15-18,26} For example, data from the US¹⁶ summate that many strategies aimed at controlling antibiotic costs in hospitals with input from ID physicians resulted in savings up to \$500,000. Similar data is emerging from Europe and the UK.¹⁷

Other evidence points to a reduction in the risk of hospitalisation and an improvement in the quality of care for patients with AIDS,¹⁹ substantial cost savings and improved quality of life outcome with Out-patient and Home Parenteral Antibiotic Therapy,²⁴ improved clinical outcome in the management of bacteraemia,²⁷ and significant benefit in the control and reduction of the spread of multi-drug resistant pathogens, especially methicillin resistant staphylococcus aureus^{28,29,30} and multiple drug resistant tubercle bacilli.^{31,32}

Of course many units in the UK already provide all or some of these services. However, as many aspects of such services are presently often provided by other specialists, who may or may not be clinicians, or they may not be

available at all, it is essential that each region contemplating setting up or re-engineering an infection service, should address its specific resources and needs, and tailor development of such a service accordingly. It is my belief that provision of a modern infection service should

TABLE 1

(a) One month in-patient infectious diseases activity of the author and (b) general infection and HIV out-patient activity of the author.

(a) 69 Patients

- 10 - community acquired pneumonia (5 had pneumococcal bacteraemia)
- 8 - gastroenteritis
- 5 - skin and soft tissue infections (not suitable or OHPAT)
- 5 - proven influenza
- 4 - viral illness (?aetiology)
- 4 - urinary tract infections
- 3 - shingles/severe oral HSV
- 2 - viral meningitis
- 2 - bacterial tonsillitis
- 2 - AIDS-related opportunistic infections
- 2 - infectious mononucleosis (one a CMV mononucleosis - in 55-year-old community dentist)
- 3 - malaria (all *falciparum*)
- 3 - hepatitis B
- 2 - PUO
- 1 - septic arthritis
- 1 - endocarditis
- 1 - sinusitis
- 3 - intra-abdominal sepsis
- 8 - general medical diagnosis (2 inflammatory bowel disease; 1 polymyalgia rheumatica; 1 'stroke'; 1 pancreatic insufficiency/ethanol related leading to malabsorption; 1 pulmonary embolism; 3 atrial fibrillation with heart failure, 1 exacerbation of gout)

(b) 32 Patients

- 1 - Lyme meningoencephalitis follow-up
- 1 - urinary schistosomiasis
- 5 - PUO - 1 probable sarcoidosis; 1 endocarditis; 1 Brucellosis; 1 new onset diabetes mellitus with recurrent urosepsis; 1 undiagnosed as yet
- 1 - disseminated *Mycobacterium avium intracellulare* (non-HIV) infection
- 1 - recurrent *Herpes simplex* infection, giardiasis, chronic lung granuloma in non-HIV immunodeficiency patient
- 4 - symptomatic HIV patients on anti-retrovirals
- 2 - recurrent skin and soft tissue infections
- 2 - recurrent oro-labial and facial *Herpes simplex* infection
- 2 - recurrent neck lymphadenopathy (one is CMV IgM+ and other Kikuchi's disease)
- 1 - infectious mononucleosis in 63-year-old man for follow-up
- 1 - recent *Legionella* pneumonia follow-up
- 4 - chronic fatigue syndrome patients
- 2 - recurrent urinary tract infections
- 1 - toxic shock syndrome
- 1 - reactive polyarthropathy following recent episode of Salmonellosis
- 1 - African tick bite fever (returning from Kruger National Park in South Africa)
- 2 - post-travel 'tropical' screen

TABLE 2

(a) Telephone advice; (b) Travel Clinic; (c) Hepatitis C Clinic and (d) Needle-stick Injury consultations given in one month by author.

(a) Telephone advice - 14 Patients

- 8 - travel immunisation/malaria prophylaxis advice; 2 tick bites in patients - advice on prophylaxis
- 2 - immunosuppressed patients with chickenpox contacts
- 1 - child with needlestick injury in the playground
- 1 - spider bite (while on holiday in Fiji)

(b) Travel Clinic - 13 Patients

- 6 - travelling to Africa requiring immunisation and antimalarial prophylaxis advice
- 1 - family of five going to live in India
- 2 - going trekking in the Himalayas wanting advice on preventing altitude sickness
- 1 - HIV+ patient planning African safari holiday
- 1 - student with splenectomy wanting to 'backpack' around Africa for 6-8 weeks
- 2 - medical elective students going to Uganda and Vietnam respectively - advice on immunisation, antimalarials, HIV prophylaxis availability

(c) Hepatitis C Clinic - 13 Patients

- 10 - mainly asymptomatic minimal disease
- 3 - patients on ribavarin + alpha interferon for moderately active disease

(d) Needlestick injury in HCW (Health Care Worker) - 2 Patients

- 1 - RHO (Resident House Officer) who sustained a penetrating needlestick injury from a known HIV+ patient
- 1 - RHO who had mucosal exposure to blood-stained ascitic fluid from 'high risk' and known hepatitis C antibody positive i.v. drug user

Both doctors received anti-retroviral prophylaxis and counselling with follow-up in the clinic.

encompass the contemporary philosophy of health care of providing a high-quality service that is no longer centred solely around in-patient isolation beds but extends specialist clinical care into the community, provides a broader remit for senior nurse practitioners (e.g. out-patient and home parenteral antibiotic therapy) and instils greater collaboration with a diverse range of specialities with the aim of providing seamless patient care. In my experience³³ what attending clinicians value, above all, is the clinical opinion of experienced ID physicians practised in the art of infection care. These clinical skills require to be maintained and improved by providing continuing patient care and responsibility^{34,35} as opposed to transient clinical contact or giving the appearance of bedside competence by way of possession of an MRCP diploma, often acquired 20 years earlier. Whether this vision of modern ID in the UK reaches the desired expansion remains a major challenge for the infection community and health planners as we go into the next millennium. On a final evangelical note, I urge

TABLE 3

Other consultations by author during one month.

(a) Unsolicited consultation for bacteraemia in medicine and surgery - 15 Patients

- 8 - coagulase-negative staphylococci bacteraemia (5) contaminants; (2) central line infections; (1) native valve endocarditis in an elderly patient
- 3 - *E. coli* bacteraemia due to UTI, biliary sepsis, cholecystitis
- 1 - *Streptococcus constellatus* bacteraemia in terminally unwell patient with gastric carcinoma
- 3 - pneumococcal bacteraemia (2 pneumonia and 1 meningitis)

(b) Solicited consultations - 13 Patients

- 4 - Oncology - unresponding fever in febrile neutropenic patient with diarrhoea - CMV colitis, cavitating pneumonia in non-neutropenic cancer patient. *C. difficile* in cancer patient, fungaemia in neutropenic patient with a reaction to amphotericin B and renal failure
- 9 - PUO - Vasculitis (1); Psittacosis (2); TB (1); Endocarditis (1); Liver abscess (1); Necrobacillosis (1); Septic arthritis due to *S. aureus*
Renal Transplant - Nosocomial pneumonia (1); *E. coli* 0157 as cause of undiagnosed acute renal failure in renal unit (1)

(c) Informal or 'curbside' consultations (eg 'can I run something by you?') - 13 Patients

- 8 - requests for antibiotic advice
- 1 - 'My daughter is not so well today with fever and this rash over her buttocks and legs - what do you think?'
- 3 - complex patient management queries leading to offer and acceptance of solicited consultation
- 1 - request from colleague - 'I have this rash over my neck and I have fever - could you have a quick look?' 'I have been to Kenya on holiday/business and still taking mefloquine. When do I stop them?' 'When did you come back?' '7 weeks ago.' 'Stop now!'

(d) Out-patient and Home Parenteral Antibiotic Therapy Program. 417 in-patient bed days saved - 21 Patients

- 12 - Marines with cutaneous leishmania returning from Belize requiring treatment with 20 days of i.v. sodium stibogluconate
- 4 - patients with cellulitis
- 3 - patients with osteomyelitis
- 1 - patient with infected bursitis
- 1 - patient with bacterial tonsillitis

chief executives considering future appointments in general medicine, to consider an ID physician, who in my opinion is an authentic internist with the skills to provide a diverse range of care. Such an individual should not be perceived by the hospital microbiologist as a threat but rather the opportunity to improve the overall infection care within the hospital. I am of the view that our close co-operation with our colleagues in microbiology has shown this to be possible and it is high time that the mutual perception of competition or threat between infectious diseases and

microbiology ceases. The proposed joint training in ID and microbiology,¹ soon to be implemented, may fulfil the needs of academic teaching centres, but is unlikely to be of significant value to DGHs which require the individual to have a sizeable internal medicine component to their job.

This paper will hopefully once again stimulate debate that will lead to the required investment⁸ of ID physicians in all UK hospitals as well providing a useful focus for those trainees pursuing a career path in clinical infection.

ACKNOWLEDGEMENTS

I am grateful to Drs A.J. France, M.McKendrick and R.A.Seaton for their helpful comments in preparing this paper.

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