

Medical Microbiology: A Modern Taxonomy

This paper by Professor Steven Gillespie on behalf of the Blue Skies Board, attempts to describe the reality of modern microbiological practice and sets out its implications for curriculum development and examination.

Purpose

Microbiology has been a part of pathology possessing one sub-specialty – virology. Modern microbiological practice has become more diverse that to provide a high quality clinical service it may be necessary to develop the concept of medical microbiologist more widely. At the inaugural Blue Skies meeting there was much, often heated debate, over the title of a practitioner of our discipline. This controversy suggests that the rubric which has defined our specialty for the past 40 years may not fit the pattern of modern service provision. The purpose of this paper is to outline an alternative approach that could serve as a central premise for the multifarious aspects of the “Blues Skies” agenda. This paper should be seen as a complement to that produced by the Association of Medical Microbiologists on service provision.

Background

One of the joys of being a microbiologist is the diversity of activities that it covers. Our discipline includes academia, public health microbiology, clinical work, laboratory management, bench work, infection control, and some microbiologists function as clinical infectious diseases specialist or tuberculosis physicians. Microbiology has continued to be a dual specialty discipline (microbiology/virology). In contrast, colleagues in histopathology have a long tradition of sub-specialty working and this has proved advantageous especially as it has been increasingly linked with the development of cancer networks. It has underpinned increased consultant numbers and, more importantly improved the quality of service with more opinions being given by specialist consultants who devote a significant proportion of their professional life to a sub-discipline.

In many larger microbiology laboratories a considerable degree of sub-specialisation already occurs within the consultant microbiology team. Even in district general hospitals the appointment of one consultant to the position of infection control doctor in a team of two or three implies specialist expertise and service delivery. Thus, it could be argued that nascent microbiological sub-specialists are emerging and that the other aspects of governance such as training, succession planning validation and re-validation are lagging behind. If this argument is accepted then there are *de facto* sub-specialists and if microbiology does not make these *de jure* it will be harder for us to respond to the needs of our users: trusts, universities, the Health Protection Agency (HPA), industry and patients who seek specialist care.

There has been a bitter controversy about the application of the current laboratory orientated curriculum in the context of Modernisation of Medical Careers in which it is anticipated that fewer candidates will enter the discipline with MRCP (UK). This has already resulted in some training schemes in London migrating or planning to migrate their programmes to joint microbiology-infectious disease. If this process is not to result in a division of the specialty new ways of considering the discipline are

required. It is no longer an issue of what microbiologists are called. We need to describe the microbiology taxonomy more accurately.

Sub-species of the genus *Microbiologus generalis*

The generalist (*Microbiologus generalis* var *generalis*)

This person would be trained to be able to perform the work of a consultant in a district general hospital. This person would be able to manage a laboratory, to advise on bench microbiology, interpret tests to clinicians, perform appropriate clinical liaison work and have general skills in infection control.

The infection control doctor (*Microbiologus generalis* var *controlis*)

This type of microbiologist would have a similar training and job plan to the generalist but would have additional validated training in infection control and hospital epidemiology. They would form part of the team at a district general hospital so would require the skills of the generalist. In a teaching hospital generalist skills would be important but more specialisation in infection control would be anticipated.

The clinical microbiologist (*Microbiologus generalis* var *clinicalis*)

This person would have a strong clinical orientation in their work where provision of clinical liaison made up the majority of their activity. In addition, they might participate in out-patient or ward based work as required in allied disciplines such as infectious diseases. It would be anticipated that, in the future, such microbiologists would have undergone joint infectious diseases microbiology training. Should there be a merger with infectious disease physicians they would sit most comfortably in this group although it is likely that they would wish to have a role in the running of the laboratory a circumstance shared by many clinical microbiologists at present who leave the day to day running of the laboratory to one of their colleagues while devoting their time to clinical work.

The public health microbiologist (*Microbiologus generalis* var *typicus*)

There is a considerable need for public health microbiologists in the HPA (as both microbiologists and consultants in communicable disease control). Yet, there has been no formal training scheme for the specialist requirements of this area of microbiology. Such individuals would require a broad general training in microbiology supplemented by additional training in epidemiology, molecular diagnostics, molecular epidemiology, and attachment to reference facilities and the regional microbiology network.

The academic microbiologist *Microbiologus generalis* var *minutiatus*)

The decline in academic microbiology has ceased and a slow recovery is underway. The concerted efforts of a number of clinical academics, Department of Health and national funding agencies have meant that a training path is emerging. Such individuals will be required in medical schools in teaching hospitals to train the next generation of clinicians and microbiologists. They would have a general training together with specialist academic training having completed a post-graduate degree and a senior training fellowship.

Oral microbiologist (*Microbiologus generalis* var *oralis*)

There is a significant cadre of oral microbiologists attached to dental schools who provide undergraduate and post-graduate education, specialist diagnostic facilities,

and perform research. Many enter this discipline following training in dentistry. Although it is important to have a broad general training in microbiological principles, the clinical practice of this group is, of necessity, restricted. In addition, most oral microbiologists have a strong academic component of their job description.

Clinical scientists (*Microbiologus generalis var scientificus*)

The trained clinical scientist in microbiology/virology undertakes a wide range of high level functions, working in multidisciplinary teams with medical and biomedical colleagues. Consultant clinical scientists practise at the same level as medical consultants in microbiology/virology. They may have responsibility for the professional direction of microbiology laboratories and services, provide clinical leadership and be accountable and set the strategic direction of the service. Specific functions may include research and development, audit and quality assurance. The consultant clinical scientist also advises clinicians on the appropriate investigations, clinical interpretation and gives guidance on therapeutic interventions and patient management.

Other subspecialties

The species *Microbiologus generalis var virologicus* has been described in detail often enough to require no further mention here, but we need to consider similar even smaller sub-specialties such as mycologists and parasitologists. Currently, there are a number of these individuals in practice usually combining these specialist activities with clinical microbiologist or academic roles. Consideration of how candidates for these subspecialties are trained and validated is important as is the need to ensure adequate succession planning as the nation is dependent on satisfactory individuals being available when rare retirements or resignations occur. In particular, there is a growing need for mycological expertise, and there is a proposal circulating through the Specialty Advisory Committee and the College Advisory Training Team (CATT) for a mycology sub-specialty.

Related taxa

Infectious diseases physicians (*Medicus contagionis*).

Infectious disease physicians increasingly spend a year in microbiology laboratories as part of their training programme and many perform laboratory based research programmes. With the trend to team working in the future it may be foreseen that teams of infection specialists will include one or more infectious diseases specialists as part of the group as is the case in many large teaching hospitals. This developing situation has important implications for microbiology training and inter-College relationships.

Public Health physicians (*Sanitas populi*).

The public health doctor may have infection as a significant component of infectious diseases in their job. They may also have had a component of microbiology training during their career. They will probably relate most closely to the generalist and public health microbiologist and may be employed by the HPA.

Implications of this document

The sub-specialties noted above are a description of the realities on the ground now. There is an inherent assumption in the paper that all microbiologists would complete general training and diversify later. The mechanism whereby this occurred would

depend on opinion from CATT, the Postgraduate Medical and Education Training Board, examiners and other stakeholders.

If we do not describe our discipline correctly it will be impossible to make plans for in the rapidly changing political, scientific and epidemiological situations we find ourselves in. This paper cannot be comprehensive since there are new challenges in the future which mean that new sub-species will evolve. Also others may see some that have been missed. The key message is that our current view of microbiology as expressed by our curriculum and examination structure does not appropriately reflect the reality of modern service provision.

This has practical implications:

1. Microbiology provides a general service in an environment where there is an increasing specialist provision.
2. Our training, examination and revalidation processes require revision to serve the needs of current practice to equip our trainees better not only in the short but also the long term.
3. We find it difficult to represent the needs of our discipline to government or NHS managers.
4. It can be argued that we must embrace new working practices fit for 21st century patterns of working to provide a better service to our patients.

Action

1. The College should establish appropriate CATTs to develop curricula to support training for the sub-specialties, including developing a view on the timing of sub-specialisation. In view of the current emphasis on mycology and on academic microbiology it might be appropriate for this new approach to microbiology to develop a CATT and examination process in these areas as an example to other potential sub-specialties.
2. The panel of examiners should be asked to devise appropriate mechanisms to examine and validate the competency of prospective sub-specialists.

Professor Stephen H Gillespie on behalf of the Blue Skies Board

Submit your views

In view of the importance of this development to microbiology we are anxious that we receive the widest possible input and advice from the community by **Friday 26 January 2007**. Please email your response to miriam.todorovic@rcpath.org