ORIGINAL ARTICLE

A survey of time management and particular tasks undertaken by consultant microbiologists in the UK

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Background: Medical microbiology practice encompasses a diverse range of activities. Consultant medical microbiologists (CMMs) attribute widely differing priorities to, and spend differing proportions of time on various components of the job.

Aim: To obtain a professional consensus on what are high-priority and low-priority activities, and to identify the time spent on low-priority activities.

Method: National survey.

Results: Many respondents felt that time spent on report authorisation and telephoning of results was excessive, whereas time spent on ward-based work was inadequate. Timesaving could also be achieved through better prioritisation of infection-control activities.

Conclusion: CMMs should apportion their time at work focusing on high-priority activities identified through professional consensus.

Medical microbiology faces rapidly rising demand, for the services of a limited number of specialists. At the time of this study, there were 68 consultant medical microbiologist (CMM) vacancies in the UK, with estimates suggesting continuing vacancies for the next 15 years.¹ In 2001, a survey of CMM working practices and priorities was carried out in south west England.² High- and low-priority CMM activities were identified, providing a rational basis for workload control. We now report the findings of a national survey, designed to validate the earlier pilot survey and to estimate the potential impact of prioritising CMM activity.

METHODS

CMMs practising in the UK were identified using data from the Royal College of Pathologists, London, UK, augmented by local information. Grade C scientists undertaking routine clinical microbiology work were included, but consultant virologists were excluded. A self-administered questionnaire based on that used in the pilot study was sent to all identified CMMs in November 2003. Non-responders were sent a reminder letter and a second questionnaire 4 months later. Respondents were asked to identify the professional group in the laboratory that undertook particular activities, and to assign subjective values of 1 (core consultant activity), 2 (desirable but could be delegated) and 3 (inappropriate consultant activity) to those activities. Values were converted to an index, with a value index of 100 indicating that all respondents rated the activity as a core CMM task. Hospitals were categorised as teaching, large district general hospital (DGH; ≥ 2 whole time equivalent (wte) CMMs) and small DGH (< 2 wte) CMMs). Consensus was deemed to exist when $\geq 75\%$ of respondents registered the same response to an activity in relation to whether or not they personally undertook a task—for example, authorising culture-negative urine.

RESULTS

Respondents

Of approximately 450 eligible consultants, 169 (38%) responded. The median age was 46 years (compared with 49 years for all CMMs) and the median time in post was 11 years (compared with 9 years for all CMMs). Most

respondents (50%) were from large DGHs, with 32% from small DGHs and 18% from teaching hospitals. In all, 34 (20%) respondents were single-handed compared with 17% of all CMMs. Most (103, 61%) respondents were also infection control doctors (ICDs; no comparable national data available).

The number of hours per week worked by full-time respondents ranged from 30 to 70 (median 47) h, excluding the time worked on-call. No correlation was found between hours worked and the number of specimens processed by the laboratory annually per wte CMM, population served per wte CMM, or the number of hospital beds served per wte CMM.

Time attribution

Respondents were asked to divide their typical hours worked per week into 10 categories, and report subjectively whether the time spent on each activity was inadequate, appropriate or excessive. Figures 1 and 2 summarise the results of the study.

The most time-consuming activities were clinical work, result authorisation and infection control. There were no significant differences in the responses between single-handed practitioners and other CMMs. Most CMMs felt that they spent insufficient time on activities such as research and development, continuous professional development and teaching.

Report authorisation

The perceived usefulness of time spent on report authorisation was analysed in detail, as this is one of the most time-consuming aspects of the CMM role, and an activity easily accessible to change. More than a third (36%) of CMMs spent more time on authorising than on clinical advice and ward rounds combined.

There was a clear correlation between time spent on authorisation and respondents' views of its usefulness. Thus, 10/41 (24%) respondents spending < 5 h/week authorising felt that this was inadequate, whereas 25/31 (81%) of those spending > 14 h/week felt that this was excessive. There was

Abbreviations: CMM, consultant medical microbiologist; DGH, district general hospital; DICEP, Director of Infection Control and Prevention; GP, general practitioner; ICD, infection control doctor; ICU, intensive care unit; wte, whole time equivalent

Figure 1 Median time per activity. Lab, laboratory; Reg, regional.

a good correlation between the value indexes of authorising specific results and actual practice (fig 3).

Table 1 lists the result types where consensus on authorisation was achieved.

Telephoning positive results

Telephoning results and clinical advice to general practitioners (GPs) and hospital staff takes a considerable part of the working day. A consensus was achieved for the usefulness of telephoning most, but not all categories of results (table 2).

Telephone advice

More than 75% of the respondents accept calls from hospital and practice nurses, and felt that this level of accessibility was appropriate. Most respondents (73%) accepted calls from receptionists of GPs, but 75% considered such calls inappropriate.

Ward rounds

Intensive care units (ICUs) were the wards most consistently and regularly visited, by 154/169 (91%) of CMMs. A quarter of the respondents (42/169, 25%) visited more than one ICU. The

Figure 2 View of the appropriateness of time spent. Lab, laboratory; Reg, regional.

Table 1 Consensus on results authorisation

>75% do not authorise negative results	>75% authorise positive results
Urine	Urine
MRSA screens	MRSA screens
Faeces	Faeces
Genital	Genital
Blood cultures	Blood cultures
	Sputum
	HIV
	Hepatitis serology

MRSA, methicillin-resistant *Staphylococcus aureus*.

median frequency was five visits per week, with a median time commitment of 5 h/week. The value index for ICU rounds was very high (99%). Other units attended regularly included haematology, bone marrow transplant and paediatric oncology; these were attended by 69/169 (41%) CMMs, and neonatal units by 37/169 (22%). In all the above units, the median frequency was once weekly with a median time commitment of 2 h.

There was a wide range of responses to questions on ward visits to review individual patients in terms of frequency, time spent and specific responses to common clinical problems. The median time spent was 5 h/week. This had a very high value index, although there was no consensus as to which specific cases merited a ward visit.

Infection control

Many respondents (103/169, 61%) fulfilled the role of ICD. ICDs spent a median of 8 h/week on infection-control work, whereas non-ICDs spent a median of 2.5 h/week. Two-fifths (41/100) of ICDs considered that they were devoting insufficient time to infection control, compared with 29% (19/65) of non-ICDs. The box lists the consensus points on infection-control tasks deemed more appropriately performed by other healthcare professionals.

DISCUSSION

Driven by a range of forces, the role of the consultant microbiologist is changing rapidly. A number of established CMM posts have been vacant for long periods of time due to shortages of trainees, thereby increasing the pressure on those currently in post.³ The recent requirement to produce more data on rates of healthcare-associated infections is adding to the workload. Staffing shortages in the specialty are unlikely to ease for many years.

Since this survey was performed, most CMMs have been transferred to a new contract, which formally defines how much of the working week should be set aside for supporting professional activities such as continuous professional development, research, audit and so on. All these factors mandate the need for CMMs to work smart—that is, productively, rather than increasing the number of hours spent at work each week.⁴

The response rate to the questionnaire was relatively low at 37%. However, the demographics of respondents were broadly similar to those of non-respondents, with the exception of a higher than expected response from single-handed CMMs. We feel that the findings of the survey can legitimately be extrapolated to the general body of CMMs. It is of great concern that there are still 73 single-handed CMMs in the UK. Alleviation of this unacceptable situation should be a priority of any local modernisation of pathology initiative.

Any survey of self-reported working hours has to be interpreted cautiously. However, as responses were anonymised, and the survey was carried out at a time when most CMMs were completing detailed diaries in preparation for the new contract, we believe the results are generally valid. It is striking that there seemed to be no correlation between the hours worked by CMMs and any objective marker of their workload. Individual choice must be a major factor determining the hours worked by a CMM. Without wishing to discourage individual excellence, there is a clear need for a more rationally defined job description for CMMs, particularly in relation to the clinical component of the role.

Figure 3 Perceived value versus actual practice for results authorisation. Auth, authorise; BC, blood culture; faec, faeces; Hep ABC, hepatitis A, B and C; MRSA, methicillin-resistant *Staphylococcus aureus*; Neg, negative; Pos, positive.

Table 2 Consensus points on telephoning positive results

>75% do not telephone	>75% do telephone	No consensus
Positive GP MRSA screens Gp A strep in throat Assays in range	Positive culture sterile site Positive blood culture Positive <i>Escherichia coli</i> O157 Hospital <i>Campylobacter</i> spp Hospital <i>Salmonella</i> spp Gp A strep in wound New positive HbsAg New positive HIV	MRSA sputum (29%) GP— <i>Campylobacter</i> sp (29%) Positive MRSA hospital (29%) Assay out of range (42%) Hospital Gp A strep in throat (57%) Blood culture on-call (70%)

Gp, group; HbsAg, hepatitis B surface antigen; MRSA, methicillin-resistant *Staphylococcus aureus*; strep, *Streptococcus*.

Some activities consuming considerable time were not perceived as very useful, notably result authorisation. When applied with discrimination, this is an essential task allowing results to be enhanced with clinical advice, withholding or releasing of antibiotic susceptibilities and identification of erroneous results.⁵ New infection problems can be detected, allowing timely intervention.⁶ Unfortunately, authorisation as currently practised is inadequately selective and unduly time consuming, interfering with more valuable activities.

Most respondents felt it would be appropriate to spend 1–2 h/day on authorisation. The survey results should reassure the 50% of CMMs spending more time than this that authorisation of many negative results is viewed as unnecessary by their peers. Improved laboratory information management systems would facilitate more efficient authorisation. By restricting medical authorisation to 1–2 h/day, the time equivalent of 22 full-time CMMs could be released for more profitable activities. Whether this would be possible without better information technology systems was not clear.

Changes in the availability of GPs, particularly outside office hours, present an opportunity to rethink traditional practices.⁷ Although our definition of consensus was not achieved, most CMMs would not personally phone a positive *Campylobacter* result to primary care. Those who still do this may wish to review their practice. The fact that more than two-thirds (70%) of CMMs personally telephone all positive blood cultures detected out of routine hours demonstrates a considerable commitment to delivering a 24/7 clinical service. Most CMMs were unhappy with their accessibility to non-clinical staff such as receptionists, particularly in primary care, and there are good clinical governance reasons for discouraging this practice.

The aspect of CMM work that respondents reported as most valuable was attendance on ward rounds of specialist units and individual ward visits. The majority already do this, particularly to ICU, where a daily visit is the norm. Many free text responses highlighted the desire of CMMs to undertake more of this activity, but that this was constrained by overall workload. We propose that any microbiology department not currently providing a daily visit to ICUs, and regular visits to other specialist areas, should consider doing so, and that these

activities should be built into job plans, and accorded a high departmental priority.

The time pressures identified in our survey and the high proportion of clinical advice given over the telephone without the CMM writing in the patient's notes highlights another problem—the difficulty for microbiologists in maintaining clinical records that fulfil the requirements of clinical governance and medicolegal assurance.⁸

Significant changes in the management of hospital-acquired infection are underway, as the role of the Director of Infection Control and Prevention (DICP) becomes clearer. We have identified a range of activities that were being performed by ICDs, but that were not considered to be a part of the core ICD role nor, by implication, the DICP role. Colleagues may find these results helpful in negotiating acceptable staffing levels for their infection-control teams.

This survey was carried out at a time of great change for all National Health Service consultants. Microbiology is a specialty in shortage, with a high number of predicted retirements over the next 10 years. The specialty can prosper only if CMMs look critically at their own practice, and minimise activities of lower clinical value. The survey identified with consensus a number of areas for internal consideration, and areas such as CMM staffing levels and inefficient information technology systems where external support is required.

Specific recommendations

- Urgent action is required to ensure that no CMM is required to practise single handed.
- All CMMs should review their practice in relation to results authorisation, with a view to limiting authorisation of negative results and spending no more than 1–2 h/day on this activity
- Microbiology laboratory information management systems delivered as part of Communicating for Health should have adequate provision for filtering results for medical authorisation.
- Significant positive results should be telephoned by CMMs only where there is direct contact with clinical staff. Telephoning results to GP receptionists should be delegated.
- Requests for clinical advice from non-medical clinical staff such as practice nurses and midwives are appropriate. Requests for clinical advice routed through receptionists are unacceptable.
- Acute trusts should receive a ward-based clinical microbiology service that includes daily ward rounds to all ICUs and regular ward rounds to haemato-oncology units and neonatal ICUs.
- All CMM job plans should include protected time for ward-based clinical activity.
- CMMs fulfilling the role of DIPC should critically review all infection-control activities and delegate those of lower priority.

Box: Consensus (>75%) on tasks that are not part of ICD role

- Practical advice on isolation
- Disinfection advice
- Child-support services division inspections
- Kitchen inspections
- Collection of surveillance data
- Audit of infection-control (IC) policies
- Teaching IC to nurses

Further details of the survey methodology and findings are available on the Association of Medical Microbiologists website (<http://www.amm.co.uk>).

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