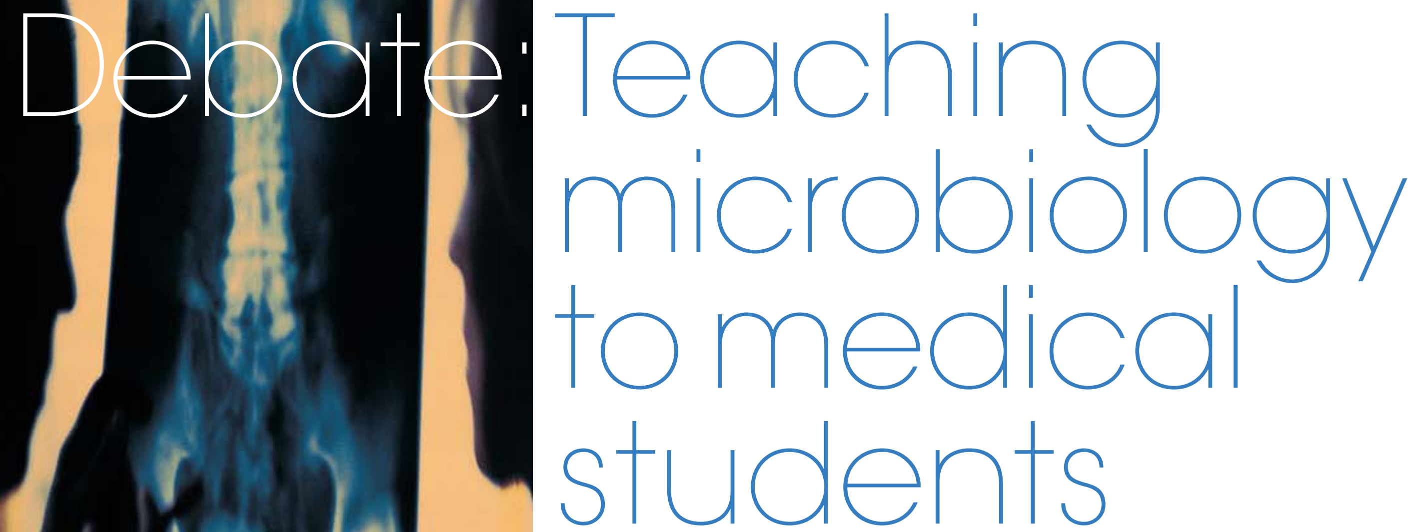

Debate: Teaching microbiology to medical students

'This house believes that problem-orientated teaching creates better doctors'

This debate, organized by the Clinical Microbiology Group, was designed to raise awareness of the perceived neglect of microbiology in the medical curriculum and related issues associated with the recently introduced problem-based learning (PBL). In some medical schools, students' exposure to microbiology and infection is minimal and experience with PBL has been mixed. I personally have limited experience in PBL teaching, but have fought hard to protect the extensive microbiology course in Nottingham, which includes lectures, wet practical sessions and tutorials. During my search for speakers for the debate, I could not find a single medical microbiologist who was in favour of PBL, whereas among other pathologists, there was no shortage of evangelical PBL proponents. The debate was held at the recent SGM spring meeting. Professor Ian Poxton was in the chair.

For the motion

Dr Peter H. Dangerfield
Medical Educationalist,
University of Liverpool

PBL, first popularized in the 1960s, is an important reform tool for medical curricula throughout the world with an impressive track record. However, there are also clear differences between problem-solving learning and learning in ways which use problem scenarios to encourage students to engage themselves in the learning process. There are also many different opinions about what PBL actually is, although there is little doubt it should truly be viewed as a total system of learning and not isolated as a part of a programme.

PBL develops reasoning abilities, deep learning, curiosity, critical reasoning and real understanding of medical issues and conditions and contributes to communication skills.

Curriculum designers may integrate knowledge across subject boundaries. Participants in PBL become knowledge-cumulative, learning in a holistic manner, and ultimately become better clinical practitioners. While its flexibility facilitates debate about contemporary issues which reflect core knowledge, it remains vital that subject specialists, such as microbiologists, virologists and pathologists engage in the development and design of courses. Ignoring this process will lead to the loss of core content and specialty status and also contribute to diminished exposure of the specialty to undergraduate students.

PBL is an ideal system that uses new ideas to create a doctor who will have explored integrated knowledge in an adult manner, empowered to be a questioning graduate able to meet the needs of Society today. It produces a better doctor.

Dr Emyr W. Benbow
Consultant Histopathologist, University of Manchester

PBL has many advantages, though the evidence is diffuse and fragmentary. Debate has degenerated. All the perceived ills of modern medical education are blamed on PBL, whatever their provenance. Many in laboratory medicine believe the loss of traditional courses compromises recruitment of our eventual successors.

A recent study from Manchester overcomes many deficits of earlier publications, examining the performance of house officers in two successive cohorts. The former graduated from a traditional course, and the latter from a radically altered course, with severe pruning of didactic teaching in favour of PBL. Graduates and their supervisors rated the former's achievement of a broad range of skills, with significant improvements in many areas, but with an important exception – although 77·9 % of the first cohort rated themselves as '*more than quite well prepared for understanding disease processes*', only 40·1 % of the latter cohort did. This appears catastrophic to doctors and scientists in hospital laboratories, but the views of the supervisors were revealing; they had less confidence in the knowledge base of the first cohort. Personal experience as examinations tutor suggested little difference between the cohorts, so why this apparent incongruity? I think it's a major breakthrough: PBL graduates have insight into the gaps in their knowledge.

PBL is an easy target for those disaffected by modern medical education, but it is not going away in the immediate future. If we want to impress upon students that careers in laboratory medicine are worth pursuing, we must get involved.

Against the motion

Professor Mike Barer
Clinical Academic Microbiologist, University of Leicester

Arguments about PBL are just one symptom of an underlying disease in medical education. In an effort to produce patient-centred doctors who communicate well, we are in danger of producing graduates who have no systematic view of subjects that provide the rationale for key aspects of clinical practice.

The microbial world is vast and unfamiliar to students. Moreover, the intersection between the practice of medicine and this unseen world is constantly expanding and shifting. Even with conventional teaching, students need time to familiarize themselves with the different names and concepts in infection. The snapshots provided by PBL sessions cannot provide a grounding that enables students to understand the consequences of this constantly changing background.

PBL is a perfectly legitimate educational approach and is an effective way of producing an integrated approach to medical problems. It works well where students have a solid grounding that enables them to define what extra knowledge and understanding they need. It becomes ludicrous when, to address the first problem, several weeks of study are necessary.

Every large group includes students with widely divergent abilities in learning through different modalities. I believe it is madness to commit exclusively to one. In doing so we risk failing to serve some students and limiting the expectations of others regarding the range of modalities they find effective.

In my talk I drew the apparently obscure analogy between exclusive use of PBL to train doctors and the new sport of extreme ironing (http://www.extremeironing.com/). While both are inspired developments invigorating stale establishments they are also both completely mad. I urge you to iron out PBL as a monotheistic approach to medical training.

Professor Will Irving
Clinical Academic Virologist, University of Nottingham

Education in medical microbiology is in crisis. Microbiology is being squeezed out of traditional curricula, resulting in young doctors not being aware of the possibilities of a career in the subject. At the Association of Medical Microbiologists, concern has been expressed that newly qualified house officers have very little basic knowledge of microbiology and infection. Adverts for Specialist Registrar posts are attracting no more than one or two credible candidates, and vacant consultant posts are remaining unfilled due to a lack of appropriately trained individuals. The introduction of PBL courses is not going to resolve, and indeed may exacerbate, this crisis. I have no objection to medical students becoming good team players skilled in communicating with patients, and regarding their patients holistically, but I am concerned at the potential erosion of knowledge and understanding of the basic medical sciences that may arise from this style of teaching and learning. Slavery to faddism, in medical education as in all walks of life, does not provide the optimal way forward. I believe there is still a potent rationale for gathering together a large number of students in one room at a specified time, and employing one subject expert to talk to them for 45–60 minutes, explaining concepts, emphasizing what is important, and displaying an infectious enthusiasm for the subject. Long live the lecture, and the didactic teacher.

Verdict

At the end of the debate, there was enthusiastic participation from the audience, which was entirely microbiological. There was a broad consensus that a mixed approach of PBL and conventional teaching would be more useful. In the vote at the end, the only people who voted for the motion were the two pro-PBL speakers.

Professor Dlawer Ala'Aldeen
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