Developing a core curriculum in clinical pharmacology and therapeutics: a Delphi study

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Introduction

Medical school curricula are rapidly changing across the UK in response to the calls from the General Medical Council (GMC) for a more student centred approach [1]. This approach should place less emphasis on acquisition of knowledge and more on establishing lifelong patterns of self directed learning. Such new courses are less subject based than traditional courses, which may lead to concern on the part of traditional teachers that their subject is no longer considered important or even relevant.

The GMC identified the 'principles of therapy' as a key component of what should constitute a core curriculum for undergraduate training, implicitly recognising the importance of clinical pharmacology and therapeutics [1]. But academic clinical pharmacologists have little room for complacency: flaws in the traditional teaching of clinical pharmacology have previously been identified [2], with few students able to apply what they had learned.

A survey in 1993 showed that few academic clinical pharmacologists in the UK were preparing to adapt to the challenges of the new curricula, and many had significant fears for the future of the subject [3]. To address the currently poor standing of clinical pharmacology and therapeutics in many medical schools and to support this subject in the transition into the new curricula, many academic clinical pharmacologists felt that the definition of a core course in clinical pharmacology and therapeutics, i.e. the essential principles that every medical student should master before registration, would be useful.

This approach was taken in the United States where it was perceived that clinical pharmacology and therapeutics would be weaker if there was no agreement among clinical pharmacologists about what they should teach as a core: if such a core could not be defined, perhaps, it might be argued, it did not exist [4]. Accordingly, a consensus derived core curriculum was developed and published [5]. In the 1993 UK survey, heads of academic departments of clinical pharmacology and therapeutics were asked to comment on what aspects of this American model they thought important. Many commented that the American model was inappropriate for the UK and that a specific UK model was needed. Many were supportive of the idea of a central broad guidance on what might constitute a core course, but argued that the fine detail needed to be left to local discussion. The GMC also suggested that specialist groups might define the core content of courses [1].

These gave an impetus to the development of a core curriculum for the UK, for which the American core curriculum might provide a useful starting point. A further impetus to this approach was given by the establishment of a review committee of the Royal College of Physicians to review the current status and role of clinical pharmacology and therapeutics in the UK. A working party of the committee of the Clinical Section of the British Pharmacological Society was therefore established to assist this review by developing the core course content.

Methods

Because of time constraints, this study was conducted by a Delphi questionnaire administered by post and fax. The Delphi technique [6, 7] is a method for structuring group communication such that individuals within a group can deal with complex problem, and in particular come to a consensus (Figure 1). The method involves developing a questionnaire which is sent to each participant, asking them to agree or disagree with each point, and encouraging free text comments. Those items for which there is a high degree of consensus (75% or more in this study) are considered resolved, either to be accepted or rejected. Where there is less agreement, the study co-ordinator develops a new questionnaire, rephrasing the questions in accordance with the comments made by the respondents; the respondents are then asked to comment again. This iterative process of establishing a question and modifying or repeating it is continued until consensus is achieved to either accept or reject the point at issue. Participants are also reminded of the areas in which consensus had been achieved in previous rounds. The title of the method comes from the oracle at Delphi in ancient Greece who answered questions either ambiguously or with further questions.

Participants should be experts in the broad subject under consideration, ideally with a range of views covering all major stake holders. Discussion outside the Delphi process is discouraged and the participants are not identified to each other.

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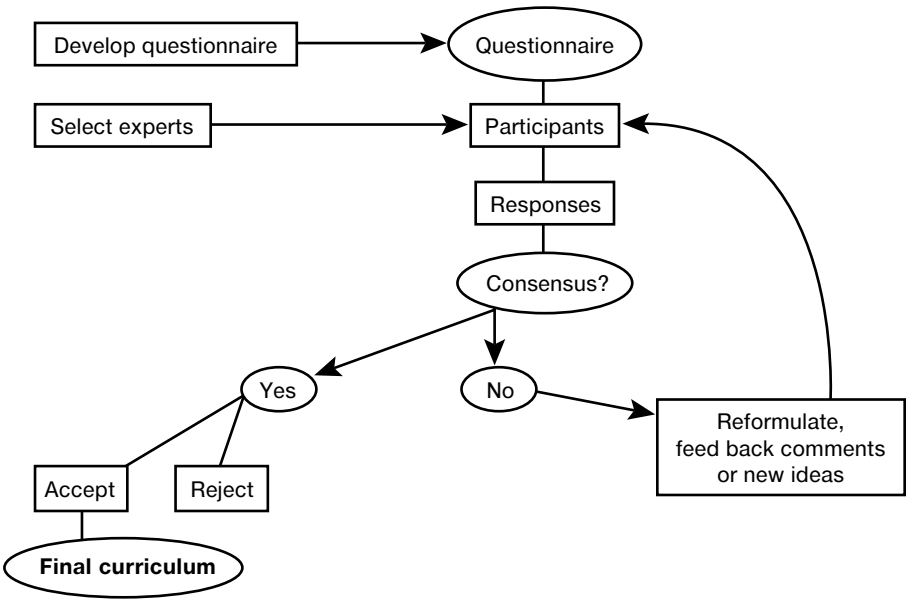

Figure 1 The Delphi technique.

Study design

The starting point for the current study was a questionnaire modified from the American core curriculum in clinical pharmacology [4], which had previously been used in the survey of departments of clinical pharmacology [3]. Participants were asked to include other items which they felt were not covered by this document, and to make other broad statements about the teaching of clinical pharmacology and therapeutics.

The participants in this study were all senior academic clinical pharmacologists, active in the teaching of clinical pharmacology and therapeutics in the UK or Ireland, and were chosen for their experience and interest in education, and for their willingness to provide speedy replies to the questionnaire. Eight were invited to participate and all agreed.

The penultimate document was sent to all participants and to all heads of departments of clinical pharmacology (where they existed) or to those responsible for teaching clinical pharmacology in medical schools across the UK and Ireland, and to the Committee of Heads of Pharmacology for final comment and to check face validity. No new points could be added or deleted at this point, but minor changes to clarify meaning were made in the light of comments received.

Results

The study ran for four rounds before a penultimate document was produced. Seven experts participated in all four rounds and one in three. The final version was drafted after receiving further comments on the penultimate version from a further 12 respondents.

The resulting detailed course is presented as a separate document [8]. It follows the outlines proposed by the GMC [1] in defining knowledge, skills and attitudes. This division is useful for describing the core content, but in clinical practice, elements of all three merge to form competencies and will therefore be learned simultaneously.

Concerning the delivery of the course, it was agreed that the best model was a single integrated course starting with basic pharmacology and increasingly involving clinical pharmacology and later therapeutics. Elements of all three should be present at most points but with the emphasis moving towards the clinical in the later stages. It was also agreed that the course was best delivered in small amounts over the whole of the medical school course, possibly with specific blocks in addition to consolidate general points made elsewhere. This model lends itself well to the new problem based curricula developed in some universities.

A key issue was who should direct the learning of the details of the pharmacology and clinical pharmacology of individual drugs and the therapeutics of major clinical conditions, an area in which competency of the newly qualified doctor is of great importance. In many schools, there simply would not be enough clinical pharmacologists to undertake this task, which is often done by clinical subject specialists. It was agreed that while the directing of the learning in these topics by clinical pharmacologists might be an ideal, it is one which we may be unable to achieve. The agreed recommendation is therefore that clinical pharmacologists should be involved in defining the course content in all of these topics and co-ordinating its delivery, but not necessarily involved in directing or delivering it all.

The American curriculum was intended to build on a course on the pharmacology of major drug groups. It seems unlikely that such separate courses are sustainable in the UK, but we are keen to recognise the important contribution of basic pharmacologists in the training of medical students. Rather than include a range of issues of basic pharmacology, the curriculum simply includes a single summary statement of the basic knowledge which a student must acquire in order to achieve competency in the other areas of the curriculum.

Discussion

The Delphi technique is particularly suitable to address certain types of issue: where the question does not lend

itself to precise analytical techniques but can benefit from collective subjective judgements; where timing and cost make frequent group meetings difficult or impossible; where likely disagreements make it essential that the communication process be refereed and anonymity assured; and where the heterogeneity of the participants is important to ensure the validity of the results [6]. It facilitates the convergence of opinion by providing structured feedback in the form of statistical information to the participants and structures the debate so as to keep the participants focused on the topic. The technique was therefore particularly suitable for this study on several points, particularly given the variety of experience across the country from different medical schools.

The strengths of the defined course are that it is a comprehensive definition of what a core course in clinical pharmacology and therapeutics should include. It is deliberately generic, and not prescriptive; it aims to establish only what the principle elements of a course should be, with the intention that these can be incorporated in a variety of ways into the curriculum in different medical schools. Integration of such a core content into the overall core curriculum is essential: an example of an approach to integrating a similar curriculum into a newly developing problem based course in one medical school has recently been described [9].

However it is to be integrated, any new course needs to be more student centred or competency centred than the older teacher and subject centred courses in the past [10]. The document therefore emphasises learning rather than teaching, and does not address in detail how the learning in these elements should be directed, as this will differ among medical schools. We believe that much of the curriculum can only be learned effectively in parallel with clinical 'bedside' studies.

The document has weaknesses also: firstly it is a consensus, which is sometimes described as where everyone agrees what no one actually believes individually. As such, a number of issues considered important by some were eliminated or heavily modified in the consensus process, including for instance pharmacoeconomics, detailed pharmacokinetics and detailed dose calculations. Some may be disappointed that it does not stridently argue for an increased role of academic clinical pharmacologists, but after much discussion, the consensus view was that clinical pharmacologists need to accept that the expansion in the discipline which would allow this to occur is unlikely. Even the modest role advocated in the document, i.e. involvement in the definition of the necessary learning in therapeutics and the use of drugs in major clinical conditions, would be an important new development in some schools.

A further weakness is that the document has been developed by academic clinical pharmacologists who may have a narrow focus and who are particularly likely to concentrate on secondary care. This may prevent them from fully appreciating the needs of doctors in primary care, who prescribe over 90% of all drugs in the UK: there have been many recent concerns about the appropriateness of the rise in the national drug bill, and the poor quality of some prescribing in primary care [11]. There have been concerns that medical school curricula have often not been relevant to the health needs of the community, and ways to avoid this should be considered: a second similar study with a wider audience would be useful in defining how clinical pharmacology can help to meet the educational needs of this audience. This was not possible within the time constraints of the current study.

The document is also lacking in detail about the assessment of the core content. Such assessment will undoubtedly remain an important part of the student's life and will to some extent shape the course. Since the development of competencies (i.e. the knowledge, skills and attitudes that the student should learn in order to become competent to prescribe drugs safely and effectively and to maintain this competence throughout their professional life) is the main aim of the course, its assessment must reflect the same emphasis. How best to test such competencies is uncertain and will require further discussion and development.

Finally, it is important that this core content be reviewed in the light of its use, and then appropriately modified to ensure that it meets the needs of the medical profession as a whole. This argues again for development of the core content by more than just academic clinical pharmacologists, but also recognises the changing nature both of medicine (for example, the move to a primary care led health service in the UK) and of medical education.

Other disciplines have also felt a need to define a core content [12–17]. Our proposals for clinical pharmacology and therapeutics are more detailed than most. All consider that insufficient emphasis is currently placed on the discipline, or that the discipline will suffer in the newer curricula. While this may sound like specialists making special pleading for their own discipline, in most cases it seems appropriate. Many represent areas of great importance because of the burden they impose on patients or to the health service, but which were up to now poorly represented in the traditional medical curricula, dominated by 'interesting' hospital based diseases, or by strong university departments. The establishment of core courses in these previously under-emphasised areas will go some way to redress the balance.

Clinical pharmacologists should now direct their efforts to ensuring that no student leaves medical school without adequately mastering this core. This should allow the student to prescribe drugs in a way that increases effectiveness while minimising harm, and if the principles are reinforced periodically, to go on doing so for the rest of his professional life, despite the likelihood of rapid changes in drug therapy in the future.

The participants in the Delphi study were: Dr J. Aronson, Oxford, Professor D. Barnett, Leicester, Dr N. Bateman, Newcastle, Professor J. Feely, Dublin, Professor C. George, Southampton, Professor P. Vallance, London, Dr D. Waller, Southampton and Professor D. Webb, Edinburgh. Professor T. Walley was the study co-ordinator.

References

1 General Medical Council. *Tomorrow's Doctors*, London December 1993.
2 De Vries T. Presenting clinical pharmacology and therapeutics: general introduction. *Br J Clin Pharmacol* 1993; **35**: 577–579.
3 Walley T, Bligh J, Orme M, Breckenridge AM. Undergraduate teaching in clinical pharmacology and

therapeutics: responses to future developments. *Br J Clin Pharmacol* 1994; 37: 137–143.
4 Nierenberg DW. Consensus for a core curriculum in clinical pharmacology for medical students. *Clin Pharmacol Ther* 1990; 48: 603–605.
5 Nierenberg DW and the Council for Medical Student Education in Clinical Pharmacology and Therapeutics. A core curriculum for medical students in clinical pharmacology and therapeutics. *Clin Pharmacol Ther* 1990; **48**: 606–610.
6 Linstone HA, Turoff M. *The Delphi Method*. Reading, Massachusetts; Addison-Wesley, 1975.
7 Reeves G, Jauch LR. Curricular development though Delphi. *Research in Higher Education*, 1975; **8**: 157–168.
8 Walley T, Webb DJ. Core content of a course in clinical pharmacology. *Br J Clin Pharmacol* 1997; **44**: 171–174.
9 Lloyd Jones G, Walley T, Bligh J. Integrating clinical pharmacology in a new problem based medical undergraduate curriculum. *Br J Clin Pharmacol* 1997; **43**: 15–19.
10 Walley T, Bligh J, Orme M, Breckenridge AM. Undergraduate teaching in clinical pharmacology and therapeutics: current status. *Br J Clin Pharmacol* 1994; **37**: 129–135.
11 Walley T. Rational prescribing in primary care—a new role for clinical pharmacology? *Br J Clin Pharmacol* 1993; **36**: 11–12.
12 Dixon RA. Medical statistics: content and objectives of a core course for medical students. *Med Educ* 1994; **28**: 59–67.
13 Doherty M, Dawes P. Guidelines on undergraduate curriculum in the UK. Education Committees of Arthritis and Rheumatism Council and British Society for Rheumatology. *Br J Rheumatol* 1992; **31**: 409–412.
14 Paton JY, Cockburn F. Core knowledge, skills and attitudes in child health for undergraduates. *Arch Dis Child* 1995; **73**: 263–265.
15 Association for Palliative Medicine. *Palliative Medicine Curriculum*. Association for Palliative Medicine, Southampton 1992.
16 Heads of Academic Departments of Public Health in the United Kingdom. *Public Health Education for Medical Students*. University of Newcastle Sept 1996.
17 Coles C, Fleming W. *A framework for developing undergraduate oncology education in the United Kingdom*. Cancer Research Campaign, London Jan 1996.

