Curriculum reform

at the University of Natal Medical School -

purging content and changing paradigm

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Master of Education

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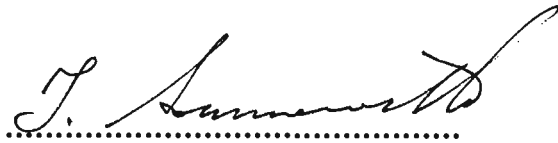
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Abstract

This work discusses issues of curriculum in terms of a case study of curriculum reform at a South African medical school, from the viewpoint of a clinical department of which teaching input is predominantly postgraduate rather than undergraduate. Concepts of curriculum and content are explored. A distinction is drawn between different uses of the term 'paradigm'. The context underlying the current educational climate nationally and internationally is described, and the course of medical education and teaching in anaesthesia traced historically. Results of a questionnaire circulated amongst general practitioners in KwaZulu-Natal, and informal interactions and semi-structured interviews with members of staff and students at the medical school, are documented. The general practitioners were broadly in favour of the changes contemplated by the Curriculum Development Task Force and indicated support for movement towards newer modes of teaching and learning. Staff and students were more equivocal about proposed change, conceding their conservatism and pointing out practical problems with initiating change in the direction envisaged, but appearing willing to proceed. Anaesthetics staff on the whole seemed more optimistic about change; they differed from the GPs, other staff and students in advising against attempting to teach specific - as against generic - anaesthetic skills to undergraduates. The responses of the different groups' opinions are discussed against the national and international background in terms of curricular paradigm, educational strategies, curriculum content and aspects of change. It is concluded that Medicine in general has operated in the natural science paradigm and that a degree of inertia has resisted changes suggested for at least the past century. The impetus for change from within medical schools, the profession and society at large is now such that transition directly to a critical mode, strongly influenced by postmodernism, is pending, the effect being that of a Kuhnian paradigm shift. The interdependence of curriculum as a whole and of content - one of its elements - is noted. Local teaching changes in Anaesthetics are compared with those of the faculty as a whole and the interaction of the now fragmented elements of anaesthesia core teaching with the reform process are sketched.

This dissertation,

except where otherwise specifically indicated,

is entirely my own original work.

T. E. Sommerville

Dedication

To my parents,
James and Polly Edward Sommerville,

my wife,
Estelle duSautoy Sommerville

and my sister,
Jaqueline Sommerville

A   M   D   G

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My grateful thanks are due

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Regards

CONTENTS

Introduction

Background

Field of study

The subject of curriculum reform is topical not only for the University of Natal and its medical school - currently a number of journals and books on the subject of medical education are devoting much of their content to curriculum. Most of the published material originates in First World countries and relates to the needs and expectations of their societies and to funding from their governments and industries. We at the University of Natal are heirs of a First World tradition of education but - at the Medical School particularly - seek to serve a population varying between First and Third World in both its medical and its educational needs. Our problems are in many respects unique, but because of our heritage and the increasing interconnectedness of the 'global village' we share concerns with medical educators generally.

The prominence of curriculum content in the title and investigations of this dissertation is discordant to the extent that content is subsumed by - and yet often conflated with - curriculum. This investigation arose primarily because of the emphasis placed on content in the faculty's approach to reform. It has seemed important to me to explore the theoretical and practical relationships between content and the wider issues of curriculum.

The position of Anaesthesia as a discipline relates to the body of medical science rather as Medicine as a whole relates to the pure sciences on which it is based. (Bernstein, 1996, 23) describes 'singulars' and 'regions' as self-contained and recontextualised discourses and gives Physics and Psychology as examples of singulars and Medicine and Architecture as examples of regions. In a similar manner, Anaesthesia is a recontextualisation - a collection - of applied medical sciences. It is an intensely practical discipline and is taught, qua discipline, at postgraduate level only, forming little of the undergraduate curriculum.

I shall reflect on developments at this medical school and elsewhere and, in miniature, on the parallels and contrasts between the Department of Anaesthetics and the Faculty as a whole.

Research questions

What has been the dominant educational paradigm in Medicine generally, Anaesthesia specifically and the University of Natal Medical School particularly?

What has motivated change and what changes are suggested by the current curricular reform process at Natal's Medical School?

Is curricular content more - or less - important than curricular paradigm in this process?

To what degree do recent changes in the course content and structure of the Anaesthetics undergraduate programme relate to Faculty-wide changes?

To what extent may those elements of Anaesthetic teaching which are to be carried forwards into the new curriculum interact with the reform process?

Definition of Terms

Curriculum

I use this term to include <u>all</u> aspects of what is taught, how it is taught, who the intended teachers and learners are, the purpose of the module or programme, what outcomes are expected for the learner, the aspects of assessment and evaluation, even timetable planning. [the 'who, what, when, why, how' (Bligh, 1995, 385), (Mundy, 1977, 111)] Often the term is assumed to mean the syllabus, or content [what is taught]; a lack of clarity on this point may well contribute to confusion as to what curriculum reform includes - assuredly curriculum encompasses far more than content. The point is made (King and Berg, 1991, 1-3) that in this country curriculum previously was seen as essentially outside the public domain, an unproblematic concept dealing only with content selection and demarcation for examination purposes. The interaction between schooling, society and historical context which a broader understanding implies was ignored. My perception is that this interaction is at least as important for higher education as it is for schooling.

Paradigm

While this term has become used loosely in a variety of popular contexts, I use it to mean a point of view or conceptual framework, shared by those working in a particular field of endeavour (Kuhn, 1970, 174). It is a non-reifiable heuristic device without external existence. This sense of the word [distinct from its original sense of 'an exemplar'] was elaborated by Kuhn when writing about the development, in discrete revolutionary steps, of science [although the term is not much heard in scientific - or medical - circles]. One can argue that the use of paradigms is itself a paradigm which one may accept or reject; the concept remains a convenient grouping or labelling device which may help to reveal and compare otherwise unspecified axioms and assumptions.

Educationalists writing on the subject [(Grundy, 1987, 10), (Cornbleth, 1990, 194), (Doll, 1993, 1-17), (Hartman and Warren, 1994, 236-239), (Luckett, 1995, 131-134), (Frame, 1996, 17-34), (Harkin, 1998, 428)] refer in differing ways to four specific paradigms, which appear to have arisen at different times and out of - or as reaction to - different historical circumstances.

- Traditional / Empirical-analytic / Functionalist / Natural science / Technocratic / Positivist

Against the background of the Enlightenment, Bacon's empiricism (Davies, 1996, 508), (Whitney, 1942, 2) and Descartes' rationalism (Davies, 1996, 509-10) which led to four centuries of The Scientific Method, and by way of W.T.Harris and John Dewey, I trace R.W.Tyler's seminal four questions which established this paradigm in education (Basic principles of curriculum 1949, quoted by Schubert, 1986, 171-172). This paradigm is still largely current in natural science and medicine - which considers itself a scientific pursuit. Knowledge is seen as value-neutral and inert; its transmission as a mechanical act; its importance in enabling us to control the world around us.

- Practical / Interpretive / Hermeneutic / Symbolic

J.Schwab (The practical: a language for curriculum 1969, quoted in Schubert, 1986, 173-176) was accused of "muddling through" when he proposed a paradigm which seeks to locate its activities in the practical realities of the teaching/learning encounter. The origins of this challenge to the positivist view of education I trace a hundred years back to Kierkegaard, who argued specifically against objectivity and detachment as a principle, and for an acknowledgement of the importance of subjectivity and of the interaction between the learner and the matter being taught (Cohen and Manion, 1989, 24-25), (Davies, 1996, 796). Knowledge is seen to be neither inert nor neutral, its transmission an

interactive constructive process, its importance in understanding the world around.

- Critical / Emancipatory / Radical humanist / Radical structuralist

To grasp the wider implications of teaching requires a penetrating analysis not only of the content but also of the circumstances under which and the purposes for which it is taught. W.Pinar [1974] and P.Freire are among those whose names are associated with this paradigm. As one might guess from some of the terms used by proponents of this approach, Marxist and other liberatory philosophies of this century have influenced it to a degree (Husén, 1988, 18). Knowledge acquisition and transmission are seen as political, potentially liberating, acts with implications for, and corresponding responsibilities towards, the wider community.

- Postmodern

As its name implies this is a relatively recent development and, like the paradigms that preceded it, can be related to the historical context in which it arose. It seems that it is hardly espoused as an educational paradigm; since education as we pursue it is essentially a 'modernist' [i.e. post-enlightenment] endeavour, to speak of post-modern education is practically a contradiction in terms. However the influence of postmodernism and the perceived threats / challenges it poses to higher education have been extensively described (Griffin, 1997, 2-3), (Barnett, 1977, 167,178) (Doll, 1993,5-6), (Aviram, 1996, 426,439).

Kuhn has pointed out that his use of the term "paradigm" was in relation to revolutionary steps of development in science when the epistemological framework of the time was challenged and eventually replaced by a new framework which in turn held sway until it in turn was displaced (Kuhn, 1970, 208). I shall argue that both an evolutionary shift between educational paradigms and a less well-defined but perhaps more revolutionary shift, as envisaged by Kuhn, appear to be taking place in medical education internationally and locally. [I concede the point (Kuhn, 1977, 228) that the social sciences, of which I think medicine is properly one, probably do not share the intensity of paradigmatic change described in the natural sciences. I wish to suggest that a significant shift is, nonetheless, occurring.]

Educational context

In higher education at least, there appears to be an increasing awareness of the pertinence of education to society and the individual. The danger of 'Curriculum' becoming a reified item itself, distinct from the teaching and learning process and thus remote from the practicalities of education, has been noted (Cornbleth, 1990, 13,19). A curriculum is realised in practice by specific people in specific contexts and is influenced by those individuals and by the society in which they are based. The importance of recognising the simultaneous existence and interplay of the formal, informal and hidden curricula has been emphasised (Hafferty, 1998, 403-407), (King and van den Berg, 1991, 2), (Mundy, 1977, 111). Hafferty suggests a need to confront the hidden curriculum and warns that:

> Redesigning the "learning environment"...is a vastly different, more difficult, but more
> responsible undertaking than redesigning a curriculum alone.

Recognition of the teacher as an expert rather than a peon in the educational field requires that s/he needs to participate actively in planning and in reflecting on her/his own interaction with learners (Cornbleth, 1990, 33), (Harris, 1990, 181). This is evidently a need in our country as much as it is globally - the imposition of solutions to problems perceived, evaluated and handled by decree from above undoubtedly accounts for friction and failure.

The effects of changing institutional structures have been categorised (Bocock, 1994, 118-121).The trend towards credit-based education implies a move from courses - usually hierarchically organised and discipline-based - to credits accumulated, possibly over a range of disciplines. This may call into question teachers' perceptions of the structure of knowledge and of the extent of their disciplinary expertise. Secondly, a move from departments to frameworks is implied. This may threaten the autonomy and status of traditionally-structured departments and their personnel. Thirdly, a move from subject-based teaching to student-centred learning may be seen as a threat or a challenge and may have the effect of separating teachers from researchers and administrators; those academics with specific teaching interests and skills being recognised as such. Fourthly, Bocock writes of a move from knowledge to competence. This is of a piece with the first three - a de-emphasising of teachers' disciplinary expertise being handed down to learners and a concentration on learners' acquiring specified abilities.

The role of the teacher and learner as a team has attracted comment (Bocock, 1994,

120), (Sotto, 1994, Ch 6), (Gibbs et alii, 1988, 23-31). Sotto particularly writes about the interaction - rather than one-way transfer - between teacher and learner. He gives an invigorating insight into the ways in which learners can be encouraged and empowered, while noting the need for the teacher to be well-prepared, open and comfortable with the necessary relinquishing of control. This simultaneous relaxation of control by the teacher and concomitant empowerment of the learner has been described elsewhere (Gibbs et alii, 1988, 25, 30), (Maclean, 1987, 129, 132) (Candy, 1987, 168-171), (Boud, 1986, 238-239). Profound changes in perception and activation are demanded of teacher and learner - the latter, at the simplest level, being called to an active, rather than passive, engagement with learning. A graphical allusion may be given by the 'pyramid of learning':

Listening	▮ 5
Reading	▬ 10 Average retention %
Audiovisual	▬▬ 20
Demonstration	▬▬▬ 30
Discussion	▬▬▬▬ 50
Doing	▬▬▬▬▬▬ 75
Teaching	▬▬▬▬▬▬ 80
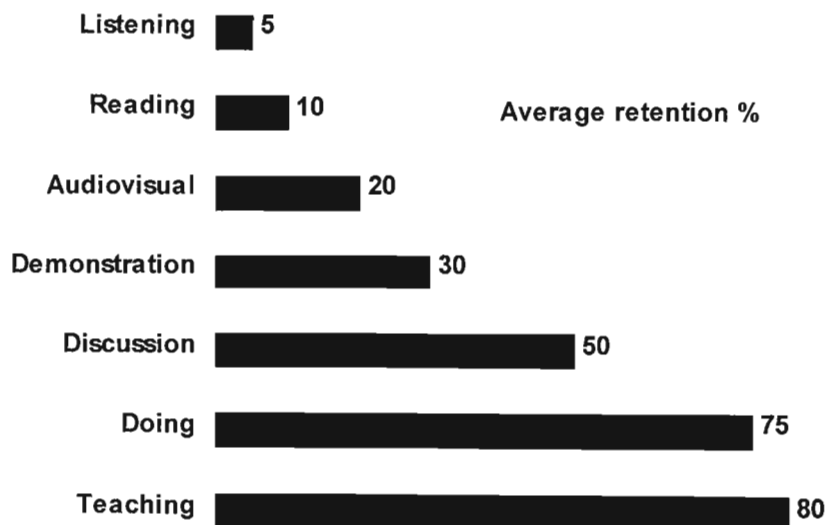
Retention of material after various activities [after van der Vleuten (1997, 36)]

Whatever the exact figure pertinent to each activity, the point is made that the more active the engagement with a subject, the greater the retention of the material.

The necessity to inculcate a practice of life-long self-directed learning, rather than teaching people only for the time that they are in our sphere of influence, is increasingly emphasised (Candy et alii, 1994, Ch 4). This may be obvious but has far-reaching implications for the ways in which we interact. Candy enumerates a number of problems with and assumptions about self-directed learning (Candy, 1987, 162-172):

- Freedom for those who can cope with it confers an advantage, but those who cannot cope remain disadvantaged. [He might have been writing of students coming from school backgrounds such as in South Africa, with a wide range from creative to rote learning.]
- Increased learner control increases motivation - generally true but enhancement of

learning outcomes in such circumstances has not been reported.

- Development of the "whole person" - this confuses the means with the end and is not necessarily so. Removing parental or teacher direction may merely allow displacement on to some other agency. [Boud points out that while independent learning does not necessarily promote independence, one would expect dependent, teacher-dominated methods to be even less likely to do so.]

- Equality of adult learners and adult educators - there are three problems:-

  Democracy - expertise, not show of hands, is actually the deciding factor.

  Morality - everyone has a right to be heard, but not everyone has the ability to direct.

  Individuality - each has the right to determine what to learn, without an imposed curriculum, but what is not learned is not known, thus the person making the choice - the student - is by definition the person least likely to be able to make that choice appropriately.

- Changed power relationship - the point is valid that one aims to establish a stance of mutual respect and to work towards the point where the teacher has made him/herself redundant, but the teacher always has the upper hand to an extent - usually in assessment. Even the decision to hand over control to the learners imposes the teacher's values.

In a contrasting critique of common assumptions, More (1974, 96 ff.) writes:

- 'The teacher, because of his/her training and background, is in the best position to interpret the learner's educational needs': in terms of providing content and format, yes, but nobody can do the learner's learning for him/her.

- 'The teacher has a duty to disseminate the societal values of which s/he is a repository': apart from the fact that such values are in a state of flux and have already been interpreted - accurately or not - by the teacher, again, learners have to find their own way and carve out their own niche, rather than adopt someone else's.

- 'The teacher must concern him/herself with the 'whole' learner': The teacher is - or should be - fully involved with maintaining personal integrity without taking over another individual's strivings.

More suggests what teachers' roles might be:

- Create an empathic, trusting environment in which the learner feels safe to be him/herself.

- Provide feedback to the learner about him/herself as seen by someone else.

- Help bring to awareness the learner's responses - intellectual and emotional - to new knowledge.

- Be present as potential support. He speaks of "the loneliness of learning".

Candy and More delineate some of the tensions that adult, self-directed, learning may generate. Fraser (1991, 43) warns of an increase in "entitlement" - the attitude that knowledge should be acquired with minimal exertion, that learning problems can be blamed on others, of aggression in response to intellectual discomfort. In this matter, as in others, there may be parallels between British and South African students.

In our national context, the interdependence of education and society alluded to by Cornbleth (1990, 24, 29) has been explicitly recognised, educational imbalances noted, economic pressures expressed, the need for new patterns of teaching and learning pointed out (DoE, 1996, 3-7) and generic outcomes for education stipulated (SAQA, 1997, 7). Cornbleth enunciates the ways in which education is used in nation-building: in socialising and incorporating diverse populations and individuals; in providing economically important skills; in conferring credentials that allocate individuals to various positions in society. Elsewhere in Africa, the importance of the university as a resource for replacing departed colonial expertise and providing political and social leadership in post-colonial societies has been described (Van den Berghe, 1973, 57-58) (Hinchcliffe, 1987, 36) (Amonoo-Neizer, 1998, 303-304). In South Africa such a vacuum does not precisely pertain but it has been stated that education has an important part to play in the transformation from oligarchy to democracy. Currently, institutional structures in higher education are under scrutiny:

> the tensions between self regulation and state supervision need to be brought into sharper
>
> analytical focus.. (Fisher, 1998, 139)

As well as societal imbalances, a legacy in higher education of inequality of provision, of staffing, of access and of throughput between different institutions has been noted and the intention to address these expressed (DoE, 1996, 11-13). Expressions of democracy and transparency are pervading higher education structures; this may facilitate empowerment of students despite an initial reluctance to take responsibility for their own learning; it may help staff to engage with new styles of teaching. The geographical distribution of universities and technikons and demographic distribution of students and staff are evidently of concern. Absolute numbers of students are increasing; this of itself will require much logistical planning and perhaps different teaching methods. Facilities at this Medical School are already close to capacity; adding far-reaching curriculum changes to an increasingly stretched resource base will not be easy.

Economic forces within and outwith this country are adduced to support an increased emphasis on science and technology. The pressure seems to be towards more focused learning to turn out a specifically trained economically active 'product'. Pressure to train basic doctors rather than specialists is in line with such a trend. The SAQA and Education Department lists of critical outcomes (SAQA, 1997, 7) and the shift towards outcome-based education serve notice that curriculum planning and praxis will probably be more critically evaluated and that courses or programmes that do not obviously contribute to defined goals are likely to come under pressure. The information load on medical students and the oft-expressed need to pare down to a core curriculum impel us to impart to our undergraduates a sense of ownership of the curriculum and of their own learning methods. Anaesthetics, which does not loom large in the undergraduate programme, may be one of the departments seen to be dispensable.

My own part in teaching formerly was that of receiving the anaesthetic curriculum as handed down from year to year and tinkering with teaching and assessment methods within previously established boundaries. My aims were to make the material presented in the anaesthetic module more widely applicable and practical, to stimulate the students to think about some of the philosophical and ethical questions which underlie practice and to reinforce some of their preclinical learning. Because medicine in general and anaesthetics in particular are applied sciences, I was less concerned to include knowledge for its own sake than to instil fundamental principles plus useful skills. I established objective criteria for marking assessments. While the curriculum was not consciously shaped around the assessments, successive generations of students have evidently shaped their learning with that end in mind. Various writers have said that the form of assessment tends to dictate the learner's style of learning (Gibbs, 1989, 14), that "as trade follows the flag, so curriculum follows the examination" (Rowntree, 1977, p61), that teaching style in general influences the learning approach but that assessment is "the most potent factor" (Newble and Entwistle, 1986, 170), or that "the examination defines the curriculum" (Buckley, 1993, 114) and "The examination is the de-facto curriculum" (Kamien, 1993, 226). In specific instances, multiple choice question examinations were found to foster surface learning while essay questions and clinical examinations made for deep learning (Hilliard, 1995, 209). Medical students, particularly in traditional content-loaded and content-examined curricula, tend to adopt a 'surface' approach. Some of our students are interested to the point of doing extra reading and spontaneously asking questions. Most, I suspect, become strategic learners and concentrate on what they have been led to expect in assessments from previous years.

Literature Review

I have explored the background of medical and anaesthetic education by means of

1. Computer database literature searches using as key words MEDICAL CURRICULUM, UNDERGRADUATE ANESTHESIA TEACHING and specific terms for specific aspects of medical education.
2. Physical searches through recent literature.
3. Tracing back references from such literature.

Europe, America, Australia, Britain

Medical education occupied scant space in medical journals in years past and evidence must be adduced from comments made in passing. A study of European developments as a background to American medical education (Shryock, 1965, 119-124) traces practical hospital-based apprenticeship and theoretical university-based teaching as separate strands, united first in France at the end of the 1700s and improved upon in the mid-1800s in Germany where "a medical professor was first expected to be a medical scientist, rather than a well-known practitioner". Britain regularised medical education in 1858, and in 1910 when in America Flexner commended the German "university type of medical school", the German scientific and the British clinical training became significant parts of American medical schools.

An interesting historical overview, from a cognitive science perspective, of medical training in the United States of America (Papa, 1999, 154-163) charts development from a loose apprenticeship through discipline-based and organ system-based models to the current problem-based and clinical-presentation elaborations, pointing out the disadvantages in terms of cognitive science of the various phases. Flexner's influence at the beginning of this century in advocating a scientifically based curriculum is emphasised. The consequences of scientific discipline-based teaching are touched on in terms of the requirement to absorb ever-increasing amounts of facts relating to the disciplines themselves rather than to the end-product - medical practice. The same writer also provides evidence of attempts to introduce a scientific basis for educational practice (Papa et alii, 1997, 25-36).

In contrast to Shryock's and Papa's overviews of developments over two to four centuries,

other authors, writing at various times in different countries over the most recent hundred years reveal a remarkably constant picture, and a corresponding continual litany of pleas for change which evidently has not taken place during this period.

In 1863 and 1869 the British General Medical Council (Smith, 1989, 1374) reported

..overcrowding of the curriculum with results injurious to the student.

Some limit must be assigned to the amount of knowledge that can be fitly exacted.

In 1900, on the subject of "The medical school of the future" (Bowditch, 1900, 1373), the speaker asked that

a distinction must be made between those subjects which it was essential that every student should know, and those subjects which it is desirable that certain students should know. In other words, provision must be made both for required and elective studies...for the curriculum of most schools was already so crowded.

He supposed that the didactic lecture "will not be displaced from its position as an educational agency", that "attention will be concentrated on one principal subject at a time, and that these subjects will follow each other in a natural order." Examinations would test the student's "daily work" and "his permanent acquisition of medical knowledge".

In 1913

the extraordinary complexity of the diet of the modern student...the futility of trying to teach all to all students...we make the examination the end of education, not an accessory in its acquisition

was the complaint (Osler, 1913, 1047). Simplifying the curriculum, minimising or abolishing lectures, giving students more free time, continuous assessment from the moment of entry into medical school and opportunity to cultivate the mind so as to be self-reliant and reflective were suggested.

In 1944 an official committee (Goodenough, 1994, 82) noted previous criticisms claiming

that medical schools were in the nature of trade schools and that both the scientific approach and research were deficient.

The committee suggested that the promotion of health was the principal object of both the health service and medical education and commended

development of mind and character...a university education on broad and liberal lines...emphasis on fundamental principles rather than the implanting of a mass of purely

factual knowledge...active partnership of students, teachers and the general public...a definite bias towards the needs of the future general practitioner. (Goodenough, 1994, 11)

In Australia, in 1971, "a period of rapid change and development" was expected (Editorial, 1971, 1357), influences being the rapid expansion of scientific knowledge, social and demographic factors and increased understanding of teaching and learning. Responses suggested were delineation of a core curriculum, emphasis on basic principles, learning how to learn, integration of subjects, and the need for medical schools to be socially relevant and to "rehumanize" medicine. An

undifferentiated medical graduate...able to continue his education in any branch or specialty...how to find and assess further information...a spirit of enquiry

was an objective (Read, 1971, 1389); the [vain] attempt of individual departments to turn students into specialists in their own disciplines and the need for some surrender of autonomy to the faculty as a whole to allow integration was noted. Use of country hospitals for teaching, provision for electives, changing patterns of assessment, including skills and attitudes as well as knowledge, were among principles mentioned (Rundle, 1971, 1392-1393). At the same time, poor history-taking and clinical examination skills and inadequate background knowledge were linked to a need to prune the curriculum.

Depth of understanding must not yield place to breadth of knowledge...instruct less...educate more (Lennon, 1971, 1398).

Innovations such as small group learning with greater student participation, less reliance on didactic lectures, more frequent assessment and feedback, and fostering the capacity for independent enquiry and continuing self-development were outlined (Bromhead et alii, 1971, 1400-1402).

More recently, an interesting content analysis of reports on undergraduate medical education during the course of this century in America has been made (Christakis, 1995, 708). There appears to be a degree of repetition without a discernible progression over this period. Eight recurring reform objectives can be discerned; these may be divided into two groups:

Core: Serving the [changing] public interest

            Addressing numerical needs for physicians

            Coping with burgeoning knowledge

            Fostering generalism

Secondary: Application of new educational methods

            Increasing the quality and standards of medical education

Addressing the changing nature of illness

Addressing the changing nature of practice

Proposed reforms, Christakis writes, have shown little alteration or development over this period. He ascribes this to two implicit functions of such reform efforts: to affirm certain core professional values such as the relationship of the medical profession to society, and to maintain self-regulation of the profession. Bloom also describes this lack of change in medical education - in the face of radical changes in medical practice and of apparent willingness of medical educators to change - and ascribes inertia to the social and power systems that have grown in medical schools, particularly the emphasis on research at the expense of teaching (Bloom, 1988, 299).

The curriculum changes recommended by Flexner have been examined (Regan-Smith, 1998, 505-506); both those that have and - revealingly - those that have not been implemented in the USA:

Implemented:	Not implemented:
A four-year curriculum	Integration of basic science and clinical training throughout the four years
Two years of laboratory science teaching	
Two years of clinical teaching	Encouragement of active learning
Affiliation of medical schools to universities	Limited use of lectures and rote learning
Mathematics and science entrance requirements	Teaching of problem solving and critical thinking
	Emphasis on life-long learning

Across the Atlantic, a British study (Towle, 1991, 5) documents wide-ranging opinion on the need for change and the principles which should inform future curricula:

Reduction in factual input

Active learning

Core principles - knowledge, skills and attitudes

General competencies

Integration - vertically and horizontally

Early clinical contact

Balance: Hospital / Community; Curative / Preventive

Wider aspects - medicolegal, economic and political

Collaboration between professions

Methods of learning / teaching and assessment that support the curriculum

South Africa

In South Africa, medical education largely followed the British system (Louw, 1969, 44), a foundation of basic science lecture-based courses leading on to clinical contact. Thus it was that in 1900 the medical schools of Glasgow, St Andrews and Edinburgh recognised Professors Beattie and Hahn of the South African College as lecturers in Physics and Chemistry, and the first specifically medical chairs established in this country, in 1911, were those of Anatomy and Physiology. At that time the desirability of separating basic science from clinical studies, and of medical teachers' being divorced from medical practice, was emphasised (Editorial, 1911, 225).

Anaesthesia

Anaesthetics made a relatively late arrival at medical schools. The earliest reference I can find is the proposition in 1901 (Buxton, 1901, 1007) to include anaesthetics in undergraduate teaching. A reluctance was noted

> to impose fresh burdens upon students...already more than adequately taxed

but it was pointed out that there was no uniform teaching of anaesthetics in Great Britain. The writer insisted that the student be actively involved in administering anaesthetics rather than "merely looking on" and that practitioners would benefit and "learn by teaching". A short course of lectures in physiology, pharmacology, theory and practice was suggested.

At the time of establishment of a Section on Anesthesiology in the American Medical Association in 1940, it was pointed out (Haggard, 1940, 4) that medicine is

> a social calling...the modern physician has not influenced public opinion but instead has been influenced by public opinion

so that the standing of a medical specialty rested on its being an intellectual as well as a manual occupation and on receiving respect and prestige from other medical professionals and from the public. The speaker was aware that anaesthesia was often

> crowded into physiology and pharmacology and its clinical aspects dismissed with a few demonstrations

but he hoped that a practical knowledge of respiratory and circulatory physiology "which most do not get", and an appreciation of the knowledge and judgement that the good anaesthetist needs, would come to be taught.

More recently, the place of anaesthesia in undergraduate training in Britain has been outlined (Harmer, 1994, 749-750). Initially a practical necessity - since, for want of specialised personnel, anyone might be called on to administer an anaesthetic - it became an established part of the curriculum from 1912 until subsequent removal in 1947 when it was felt to be more suited to postgraduate study. After reinstatement at undergraduate level in 1980, the actual administration of anaesthetics received less attention and specific problems or areas of anaesthetic expertise have been taught: cardiopulmonary resuscitation, airway management, care of the unconscious patient, care of the critically ill patient, venous access, fluid balance, preoperative assessment, postoperative management, clinical pharmacology and pain control have been included (Harmer, 1994, 749), (Prys-Roberts et alii, 1998, 355-357).

Research Methodology

In the light of my understanding of moves in education generally, and in this country particularly, I have explored perceptions of the current curriculum reform initiative amongst various constituencies ['stakeholders'] by:

1. A questionnaire circulated among non-specialist doctors in KwaZulu-Natal and telephonic interviews with selected practitioners. [Some of these doctors are in private general practice and some in hospital practice. I shall refer to them all as general practitioners / GPs.]

2. Interviews with medical students in their fifth year of study, following on from questionnaires previously administered (Manning et alii, 1995a, 1-5), (Olmesdahl, 1999, 179).

3. Participant observation and interviews with staff members in the faculty following on from past questionnaires (Manning et alii, 1995a, 1-5), (Manning et alii, 1995b, 1-5).

GP Questionnaire

1. The questionnaire circulated to KZN doctors contained two sections. The first, general, section consisted of 67 questions: 3 were personal data; 15 were statements to which they were asked to respond on a 5-point Lickert-type scale of agreement or disagreement; 14 were visual analogue scales on which they were asked to mark points between opposing poles on a 100 mm line; 35 were areas which they were asked to rate in terms of importance to their own practices on a scale of 1 to 10. Open-ended questions were asked about other areas useful to the respondents' practices, expansion on any of their answers and further comments or suggestions on medical education [Appendix 1a].

In questions 5 to 18 a five-point scale was chosen to allow a range of agreement or disagreement. A neutral midpoint was included since the questions dealt with matters on which general medical practitioners might not have formed opinions.

Of questions 19 to 32, all but the last two were drawn from the "SPICES" model of curriculum development (Harden et alii, 1984, 285) although the descriptions of the elements are my own. The pairs were posed as visual analogues rather than asking for numerical ratings of 0 - 100 or 0 - 10 because I was more interested in the relative positions of the two marks on each continuum than in asking respondents to pick a number. The allocation of lower numbers towards one element and higher numbers towards the other element of each pair might have suggested that one was more highly

valued than the other. For similar reasons I alternated which of the elements from Harden's two lists of extremes appeared on the left and which on the right hand end. Visual analogue scales are much used in pain management and the use of a verbal analogue ["What number from 0 - 10 describes your level of pain now?"] as a substitute for a 100 mm line has been validated (Ekblom and Hansson, 1988, 481-486), (De Conno et alii, 1994, 161-166), (Jelsma et alii, 1997, 256-259); nonetheless I feel that deciding on particular numbers intrudes on the process of envisioning positions on a continuum.

In the third area of the questionnaire [questions 33 to 67] GPs were not asked in an open-ended fashion for an indication of the scope of their practices, since that in effect [if not in actuality] had been done by those who drew up the country's Essential Drug List, which was based on conditions occurring commonly in primary health clinics. Instead, the areas [derived from the Essential Drug List information] which we had planned to cover in the new curriculum were presented for evaluation in the form "Which would you have found useful to have been taught for your own practice?" For these questions, a broader scope of responses [1 -10] was offered than in questions 5 to 18 since I felt that elements of content would be more familiar to practitioners and that over a variety of types of practice there would be a wide range of responses. Recognising that we might well have omitted areas of significance, I asked them to indicate if other areas should be included.

2. The second section of the questionnaire [Anaesthesia] contained 13 questions: one relating to the respondents' practices, 11 paragraphs describing the elements proposed for inclusion in the new curriculum as core items for a general practitioner and asking for a 5-point Likert-type response as to whether the item should be included or left out, and one question on whether the administration of anaesthetics should be taught to undergraduates. An opportunity was given for mentioning further topics that should be included.

A five-point scale was used in this section since I did not expect general practitioners to have detailed knowledge of a specialised discipline and thus to have a large range of opinions. A neutral midpoint was provided, as in the general section [Q 5 - 18], to allow for indecision.

In view of the specialised nature of the enquiry, a pilot study was done, asking a number of local GPs to comment on the questions and layout in terms of intelligibility and practicability in answering. Minor changes were made as a result. The questionnaire was sent to 294 doctors selected from the South African Medical Association's database by choosing every tenth name from the list of non-specialists whose postal address is in KwaZulu-Natal.

Using an Excel spreadsheet (Microsoft Corporation, Redmond, WA), data were recorded directly, except for questions 19 to 32 in which the distance in millimetres from one end of the analogue line was measured. The end from which the measurements were taken was that corresponding to the 'traditional approach' in Harden's paper (Harden et alii, 1984, 285). Answers using a Likert scale were grouped into those agreeing [responses A or B] and those disagreeing [D or E]. Data were analysed quantitatively where appropriate, using the SPSS package (Statistical Product & Service Solutions, Chicago, IL). Student's t test was used to test for differences in numerical results, a p value < 0.05 being taken as significant.

Personal interviews / observations

1.   Interviews with students were conducted during their fifth year, when they have contact periods with Anaesthetics as a discipline. Two groups, one of five and one of six students, were interviewed towards the end of their two-week stint in R K Khan Hospital's operating theatre suite, during which I had daily contact with them and had built up a degree of rapport. Their participation was voluntary, and in each case all appeared keen to be involved. Discussion was encouraged around four questions:

   What do you see as the purpose of the M.B.,Ch.B. course?

   What do you think is wrong with the present course/

   How might we attempt to correct those items which are problematical?

   What do you know - and what do you think - about the proposed changes?

With their permission I made brief notes as we spoke, and transcribed them subsequently.

2. My interaction with staff members in general was more varied and less structured.

a) As a member of the Curriculum Development Task Force I have been able to monitor directly the nature and process of the current general curriculum reforms, including the [implied] weightings of content and paradigm, and the disposition within the new curriculum of elements of anaesthesia.

b) I was approached by an individual, seconded by his head of department after the development process had been under way for some time, who was seeking information in order to catch up with the process, and who at the same time was reflecting the concerns of other members of his department. This gave me an insight into a relative outsider's view of the process and the issues. Presentations to the Executive and Board of the Faculty also evoked comments and questions mainly from those not involved with the process.

c) In a more structured way, I approached four individuals, two in basic science [pre-clinical] disciplines and two in clinical disciplines, choosing one in each pair who was actively involved in the reforms and one who was not. My research questions [as appearing in the Introduction] I rephrased as follows:

- How do you see our role as lecturers? Is this role changing / will it change? Why?

- What do you think is driving this process of change? How should we respond?

- Which do you think is more important: curriculum content or what staff and students make of it?

- Do you think that Anaesthetics as a discipline has a contribution to make in the new system or do you think that anaesthetists as exponents of certain viewpoints and certain practical skills have a contribution to make? How do you envisage any such contribution?

3. Anaesthetists' perceptions about their discipline I have gleaned from informal contact over the years.

a) The evolution of the [discipline-based] undergraduate anaesthesia programme was my responsibility in the early years of this decade; from September 1995 I have had a less active role but have been able to observe developments from my continued involvement in teaching.

b) With reference to curriculum, I have issued questionnaires to members of my department and to students over the last couple of years; these have focused on the content as currently taught but reflect some insights on what the content should be [Appendix 4a].

c) A number of comments and questions were voiced by members of the department this year during and after an interactive presentation to a departmental meeting of issues to do with medical education and anaesthetic input [Appendix 2b].

Results

1. <u>Questionnaire to general practitioners</u>

Of the 294 questionnaires sent out, 57 were returned - a response rate of 19%. In the original sample, judging by their addresses, 43 [15%] of the GPs were in small towns or rural hospitals - of these, 7 [16%] replied; 251 were in urban practices - 50 [20%] of these replied. While a larger representation of rural doctors would have been more satisfactory, the difference in the proportion of returns is not statistically significant [p = 0.7]. [I have excluded from analysis one questionnaire returned by a doctor who is a non-specialist but has never been in general practice, being on the staff at UND Medical School, and three completed and returned by those asked to comment in the pilot study.] The majority of respondents were trained in South Africa, the second largest group elsewhere in the world and a minority were Durban graduates. On average, they had been in practice for 16 years [range 1 - 49]. Their own training had averaged 5.9 years and their suggested duration of training averaged 5.6 years, a small but statistically significant reduction [p < 0.001].

Responses to statements 5 to 18 were in the main well polarised between degrees of agreement and disagreement, with 98 neutral [C] responses and 8 blanks out of a possible total of 784 responses in this section. Question 10 was an extreme, with only two respondents agreeing with the statement. The most ambivalence was shown in the case of Question 18, with 25 agreeing, 19 disagreeing and 13 neutral or blank, followed by Question 14 with 29, 19 and 9 respectively. The consensus was that the main function of a medical school should be the provision of knowledge[Q5] - factual knowledge is still important[Q10] - and that graduates should have covered all of medicine[Q6], basic medical sciences being integrated with clinical material[Q11]; nevertheless, more knowledge is used in practice than was learnt at medical school[Q13], at which too much specialised information was taught[Q14]; the teaching process[Q7] and transmission of cognitive[Q15] and practical[Q12] skills are more important than teaching facts alone; students do interpret knowledge for themselves[Q8] and society's expectations should be relevant[Q9]; not only faculty staff should be teaching[Q16]; this is not the wrong time to be making changes[Q17]; matriculants should be able to cope[Q18].

In the fourteen visual analogue polarities [items 19-32], comparisons between what respondents had experienced themselves and what they felt was the ideal showed a movement towards student-centred[Q19-20, $p < 0.001$] and interdisciplinary[Q23-24, $p < 0.001$] learning and away from a completely laid-down programme[Q27-28, $p = 0.008$] with a marginal preference for problem-based learning[Q21-22, $p = 0.667$]. Questions 25 and 26 suggest a broadening of nevertheless firmly hospital-based teaching [$p = 0.085$] while questions 29 and 30 imply that clinical teaching should be less systematic and more opportunistic than before [$p < 0.001$]. Statistically, the overall difference between what respondents had experienced [Q19,21,23,25,27,29] and what they thought was the ideal [Q20,22,24,26,28,30] was highly significant [$p < 0.001$]. The feeling that medicine should be taught as a science rather than as an art was, on balance, maintained[Q31-32, $p = 0.149$].

As regards the content of the proposed new curriculum [items 33 -67], opinion was quite widely spread, resulting in average scores above 5 for all areas mentioned [Overall mean score was 7.3]. The areas scoring highest were:

    Clinical skills[Q35]

    Cardiorespiratory disorders[Q42]

    Communication skills[Q33]

    Paediatrics[Q65]

    Medicine [Q62]

Those scoring lowest were:

    Jaundice[Q56]

    Cellular dysfunction[Q50]

    Growth & Development[Q37].

    Digestion[Q44]

Of the 57 replies, 33 included suggestions or comments [Appendix 1b] and 31 asked to see the results of the survey. The majority of suggestions emphasised items already present - although their inclusion was not always evident from the module titles in questions 33 to 67. Suggestions included:

Cultural attitudes; Social values; Culture, beliefs, customs; Social values;

Value systems & values that inform behaviour

Communication skills; Interpersonal relations; Personal interpersonal

relationships; Interpersonal relationships and synergy; Language skills e.g.

Zulu

Computer skills; Computer skills

Business management; Time management Finance management; Practice

management; Time management; Financial management; Time management

Alternative medicine; Other approaches - traditional/chiropractic/holistic

HIV - AIDS

Forensic medicine

Orthopaedics

Obesity

Anxiety

Sports medicine

Other items suggested which had been implicitly included in the core curriculum, but which may need to be emphasised when constructing individual modules, were:

Emergency medicine Emergency procedures

Chronic disease management - Diabetes - Hypertension - Chronic renal

failure

Suggestions relevant to the paradigm in which we teach were:

Points 62-67 covered in 36-61 not as separate subjects.

There is room for improvement and fine tuning. There is no place for drastic

changes.

Curriculum should be set without political interference.

I strongly feel 10 years required for this training but the doctor should be

fully utilised as head of team in rural area.

..Doctors..not to be marginalised to a "community servant"..gentleman with

high esteem in society - also as far as remuneration is concerned.

..More generalised view of what 'the public' suffer from most of the time.

Generalists rather than specialists should come out..humble and not

arrogant.

..Needs input from practising GPs etc. - should never be centralised.

These tutors need not necessarily be within the academic fraternity but

from the doctors in the community..

A healthy balance [between technological advances and primary health care]

must be maintained as patient population is dynamic in terms of their

pathology.

Also related physiology should be included in the clinical discussions.

..clinical teaching is too divorced..teach by systems and diseases

incorporating [basic sciences] and clinical manifestations..eliminating clinical

years per se..

Importance of hobbies.

1b. Anaesthesia questionnaire

Appendix 1f: Responses

Appendix 1 g: Summary of responses

Appendix 1h: Comments

This section drew 55 replies, of which 12 included comments or suggestions. The majority of practitioners [35] had little or no involvement with anaesthesia as part of their practice but 13 had a more substantial involvement - illustrating this country's dearth of specialists and the fact that GP anaesthetists are still common in both urban and rural settings. There were relatively few disagreements with the areas mentioned; most notably intensive care [6 against] and dealing with death and bereavement [4 against]. Respiratory support was not particularly popular. The items attracting most agreement were: Care of the unconscious patient, Cardiopulmonary resuscitation, Intravenous fluids, Preparation for anaesthesia and Acute pain. The majority [38] were in favour of undergraduates being taught to give anaesthetics, with 4 dissenting.

Of those who made comments, most were in favour of practical training for undergraduates and made suggestions of particular drugs or techniques which should be taught for use in practice. A number emphasised being able to cope with problems and showed awareness of potential dangers. The difficulty of finding oneself in circumstances where one would have to administer an anaesthetic was evident in several responses. Two respondents indicated that they learnt to give anaesthetics only as postgraduates. One respondent suggested that the practice of anaesthesia should not be a priority for students:

Airway management, Life Support (advanced); Death & Bereavement & Pain

Management more NB than Doping for undergrad!!

2. <u>Staff contacts</u>   Appendices 2d - h

Having set out to interview four members of medical school teaching staff, time constraints during my contacts with each of them and a fairly negative reaction to new ideas in one instance led me to seek a fifth opinion. I thus have examples of a preclinical teacher not directly involved in the process of change [Appendix 2d], a preclinical teacher deeply involved [Appendix 2e], a clinician involved with the process [Appendix 2f] and two clinicians not involved with reform efforts [Appendices 2g, 2h].

Their responses related to their degree of involvement with - and perhaps therefore their understanding of - the curriculum reform process. Those already involved were enthusiastically positive about the idea of change. Those not involved were more conservative if not actually negative about what they perceived to lie in wait for them; one had taken the trouble to attend a number of sessions and declared herself to be open to change; one, despite having been actively innovative in teaching in his own field and having attended some curriculum development task force sessions to give and seek technical input, was surprisingly pessimistic about the possible gains to be made by changing the system, although he was prepared to accept the word of educational experts that this was the way to go. Those against or neutral towards change were concerned about the efficiency of problem-based learning in terms of what they foresaw as a greater time expenditure on the part of teachers and smaller knowledge gains for greater time expenditure on the part of students; on the basic science side, postgraduate teaching and research were expected to suffer; on the clinical side, the service load was seen as a constraint. Large group lectures were seen as more efficient. Those committed to change were more interested in the potential benefits than the potential problems.

There was a perception amongst those against change that it was being foisted on us from without - by the university or the government, and imported from America. Those in favour of change saw it arising from changes in teaching methodology, in information overload, of needing to inculcate a sense of life-long learning. An increase in student numbers was uniformly seen as problematic in terms of resources and logistics.

As regards the relative importance of content or its presentation, the 'conservatives' felt that their duty is to convey content and to maintain the integrity of their disciplines. The 'progressives' acknowledged that there is a critical minimum [core] content which needs to be covered, but beyond that they felt that the way that students are taught to deal

intellectually with content is more important.

The staff member who questioned me [Appendix 2a] voiced a range of concerns, reflecting no doubt the variety of opinion in his department. "What is wrong with the system?" was the first. He had valid, probing questions as to whether the proposed system to be substituted would be effective. He expressed a fear that our wealth of clinical material - 'our best resource' might be squandered, was concerned that teaching of clinical skills be regularised and that sequencing of material over the duration of the programme would be appropriate. He also was concerned as to time commitments related to the service load on his department, and about the quality of outsiders' teaching.

The questions and comments which arose at the faculty board meeting related more to practicalities than to theories, although some of the tenets of self-directed small-group learning were questioned [Appendix 2c]. The tone of the meeting was probing rather than accepting, although, pending a detailed feasibility study, the curriculum initiative was supported.

Interestingly, amongst my five selected interviewees there was agreement that Anaesthesia as a discipline should have representation and input in the undergraduate curriculum. It was acknowledged that there are particular skills and viewpoints which should be taught during the course of the medical degree programme, but the discipline's presence was seen as important independent of those generic contributions. The feeling was generally that students should be prepared for the time when they might be "in the bush" and needing to give an anaesthetic. This was not clearly articulated - some said that the theory and potential dangers of anaesthesia should be dealt with, some implied that by an undefined time - at least before the end of their internship - embryo doctors should learn how to administer an anaesthetic.

Members of the Anaesthetics department, however, were by and large against the idea of trying to teach students - or interns - how to administer anaesthetics [Appendix 2b]. Their feeling was that generic skills should be taught at undergraduate level and that graduates should spend a significant amount of time learning anaesthesia before being encouraged to 'go it alone' in remote locations. Anaesthetics staff expressed a surprising degree of interest in theories of higher education.

3. <u>Student interviews</u>

As has been found elsewhere (Guilbert, 1998, 68), (Fox, 1993, 805), with regard to changes in the style of teaching they were accustomed to, these students were conservative - consciously so. Despite a perceived lack of practical application of the M.B., Ch.B. course - they felt that learning to be a doctor started to happen towards, or even after, the end of the academic programme - they maintained that separation of basic sciences and clinical skills was necessary. They felt that all of the former should be learned before encountering any of the latter. The inevitable repetition of basic material when required in the clinical years was seen not as a waste of time but positively as an advantageous revision. While the gap between learning and applying basic science was not seen as a major problem, a gap in a clinical block of teaching was seen as an impediment. The lack of patient contact in the three preclinical years was felt to be a necessary frustration but they were in favour of earlier contact with patients.

There was a perception of patchy and unstructured coverage of clinical skills which earlier patient contact might ameliorate. An undercurrent of anxiety was apparent - more so among the female students [perhaps only because of their greater willingness to express themselves] - with regard to when they would actually acquire clinical ability. This group expressed the thought that clinical skills teaching should be regularised and that clinicians should not assume knowledge of various techniques. The idea of learning skills on models before encountering patients did not meet with great enthusiasm.

The current first year, which is largely pure science and overlaps with secondary school teaching, was uniformly felt to be unnecessary. Making Chemistry, Physics and Biology required subjects for matriculants wishing to study medicine was suggested.

Despite one person in each group having been involved in discussions on the proposed new curriculum, both knowledge of the suggested structure and understanding of the underlying principles were patchy. None of the fifth year students have experienced problem-based learning, our two experimental PBL modules having been started subsequent to their passage through first and second year. Their impressions were unfavourable although one student acknowledged her younger brother's grasp of the basics of the cardiovascular system after doing the relevant module.

Students entering medical school in later years, having supposedly come up through outcomes-based schooling and being more familiar with computer-based learning, were

expected by these two groups of students to be able to cope better with a problem-based format. A need for guidelines on how much information to accumulate [given that one could extend one's searches as far as one wished] was generally expressed. There was a grudging concession that, if the perceived practical problems were dealt with, the new curriculum might be effective.

Discussion

Methodology

Methodological reliability & validity

Approaching every tenth doctor from a database sorted by postal address does not guarantee a random selection. However, constraints of time and cost militated against a truly random process of choice and I expected the size of the questionnaire sample to mitigate possible bias. While the number of returns is too small for me to claim representation of the sample - let alone of the 2944 non-specialists in whose opinions I was interested - the responses showed a degree of agreement which indicates a homogeneous body of opinion. My piecemeal sampling of opinion within the staff and student bodies may similarly have introduced a bias of which I am unaware; again, a thread of homogeneity suggests that these may be representative samples.

One evident source of bias is that the majority of questionnaire replies were from long-established GPs - with an average of 16 years in practice. The under-representation of younger doctors may be partly due to their greater mobility - questionnaires were returned undelivered or with annotations that the addressee had moved. This lack, while it may have deprived me of more modern viewpoints, does mean that the opinions obtained represent a substantial body of experience [890 years in toto]. A prior record of what the ideal was felt to be say, five, ten or twenty years ago would have provided a satisfactory measurement of educational trends. As it stands, what is captured is shifts in perception. Within the medical school we have few mature age students; those interviewed would be in their early twenties. Staff turnover almost guarantees a spectrum of ages although my choice of senior staff to interview ensures a certain antiquity amongst this sample. My original intention was to present a questionnaire similar to the GPs' to staff and senior students so as to allow a direct comparison between the opinions of all three constituencies but developments in the reform process were felt to be at such a delicate stage that I was advised not to stir disquiet by questioning aspects that had already been debated.

A potential source not, perhaps, of bias but of random error is the degree of engagement with the questionnaire by those who did respond. The temptation to answer indiscriminately in order to expend as little time as possible on answering a lengthy questionnaire must be considered. The relatively small number of neutral or blank responses and the spread of responses throughout the range offered for the Likert-type

questions suggest that respondents did apply their minds to the items. The variety of comments and suggestions also implies a degree of engagement. Questions 33 to 67 were in a few cases left entirely blank - presumably because the respondent failed to turn the page. Of the visual analogue questions [19 to 32], three were left unanswered and four were marked in such a way as to suggest that the respondents had not understood the intention and/or had marked the lines at random. Where distinct marks had not been made on the lines those responses were not included.

Even if the products of my investigations are reliable, they beg the question: are the instruments valid? I did not address my five research questions directly to those I approached but rephrased them in ways that I felt related to the circumstances of the respondents. I feel that the contents of my research questions were covered by the instruments. [I did not address elements of anaesthesia when interviewing the students since I felt that their being in the Anaesthetics block and being questioned by an anaesthetist might bias their replies - I had previously elicited the opinions of this, and last year's, class prior to contact with anaesthetics (Appendices 4b & 4c).] In terms of construct, some of the answers to the research questions could not be answered directly by my respondents but required an assessment on my part based on their input. I feel that my inferences and decisions on this basis are "..meaningful, appropriate and useful" (Bachman, 1990, 25). The following paragraphs include a discussion of the validity of my investigation of paradigm.

Paradigm

Curricular paradigm

1. General

Bernstein describes what he calls three "competence modes": liberal/progressive, populist and radical (Bernstein, 1996, 67). These appear approximately to correspond [although it is difficult to be certain since he writes in a "singular", self-contained fashion without external reference] to the positivist, hermeneutic and critical paradigms. At the same time he describes three "performance modes": singular, regional and generic. The possibility of classifying educational activities in several different ways points up the complexity - and perhaps the danger - of assigning a particular endeavour to a specific pigeonhole, the more so since one finds that in a particular context elements of more than one paradigm may be discerned. This makes for uncertainty in those who like dogma, but real life is seldom uncomplicated, and to make teaching so for the sake of simplicity seems misleading. It is in the exploration of these untidinesses that we learn to think critically about 'facts' and turn them into 'knowledge'. Others have written about the need to introduce medical students to the concept of uncertainty.

The descriptions which Zuber-Skerrit gives of behaviourist, cognitive and holistic learning theories (Zuber-Skerrit, 1992, 38, 41, 44) make movement from one to the other appear to me as a progressive development rather than an oppositional substitution. The manner in which Cornbleth (Cornbleth, 1990, 194-197) appears to set in opposition the empiric-analytic [traditional], the interpretive [hermeneutic] and the critical [questioning] paradigms of curriculum seems to demand that I choose one of the three. I feel that the truth may lie not in a wholesale adoption of one but in a Hegelian dialectic between thesis and antithesis leading to a synthesis of two - or three - alternatives. In this sense I see paradigm shift as revitalising, rather than replacing, my grasp of curriculum issues.

The curriculum paradigm to which I [and probably much of the medical faculty] am accustomed is undoubtedly the traditionalist: directed from above, supportive of the status quo, treating knowledge as an inert object which can be dissected and presented piecemeal, unwittingly encouraging a surface learning approach. Being science-trained, I have assumed that knowledge is passed down from generation to generation of scholars, each of which elaborates and contributes to the whole. While I appreciate the polemic around the idea that 'knowledge' is not immutable, but that our understanding of a

matter depends on the circumstances surrounding both it and ourselves, I do not have a problem with the Scientific Method as such - each scientist, if honest, concedes that 'knowledge' refers to what we understand today, bearing in mind that tomorrow may reveal something which requires a rethink. I agree with those who argue against fixed ideas of 'reality' and with Rowntree who refers to

> McNamara's Fallacy..making the measurable important when we would be better employed attempting to make the important measurable.   (Rowntree, 1977, 68)

Mistaking one for the other does science - and all cognitive spheres of endeavour - a disservice.

My misperception of Gagné's idea that learning is hierarchical as regards intellectual skills (Gagné, 1985, 128) led me in the past to support a hierarchy of content in terms of which the preclinical 'basic sciences' provided the foundation for the clinical disciplines to the extent that one could not think of teaching any of the latter before one had taught all of the former. Furthermore, I believed that the traditional didactic transfer of information was effective and in the position [whether actually true or not] of the teacher as expert. This often proved stressful when I as 'expert' felt that I was insufficiently knowledgeable about a particular topic. Conversely, I enjoyed sessions with postgraduate students when they were so well prepared that they virtually taught themselves, leaving me to steer, to correct, to participate or not. Surely undergraduate education should be thus.

Descriptions, en passant, of medical education make it clear that during the past century's exhortations to change curriculum content and delivery, a technicist/natural science paradigm has been - and in the main still is - paramount in medical education. This is hardly surprising since much of natural science, to which medical folk still feel more akin than to the social sciences, still operates in this paradigm. It can be argued that the natural science paradigm is appropriate for 'pure' sciences, which arose from, and have been a particular feature of, the "Modernist Project" (Harkin, 1998, 428) to which, as I have said already, I think the roots of the technicist paradigm may be traced. It is moot whether 21st Century medical education, aware of the tugs of critical scrutiny and postmodern tensions, can remain comfortable in a technicist mode. A growing awareness of discomfort is perhaps part of the tension experienced by those who write of a crisis (Lowry, 1992b, 1277), (Iglehart, 1998, 960) or paradigm shift (Rabkin, 1998, 127), (Ginsberg, 1993, 519) in medicine.

I am unable to find specific descriptions of Chinese and Cuban medical curricula, in which

the training and practice of the 'barefoot doctor' who relates to the community in which s/he lives is perhaps more akin to the critical/emancipatory paradigm, but from descriptions in the literature (Stein, 1987, 867) [China], (Kadlic et alii, 1972, 180, 183) [Slovakia] and from experience in Poland (Ann May: personal communication) it would appear that the 'Western' technicist approach to medical education and practice has been almost universally adopted.

Statements 7 to 10 in the GP questionnaire represent my attempts in caricature to elicit opinions on the four paradigms mentioned in the introduction. Scant justice is done to all that is implied by these paradigms in trying to encapsulate each in a single sentence, and the possibilities for misunderstanding are so great as to vitiate any pronouncements on GP conceptions of educational paradigms. Granted these strictures, the responses are intriguing. There appears to be a recognition that the transfer of knowledge is not an inert process, that transformation may occur both by the transmitter and the receiver, that influences from beyond the walls of academe have relevance but that there are certain givens which are immutable: statement 10 ["..hardly worth teaching 'facts'"] attracted, of all those in this section, the most unequivocal response - in the negative. These responses, together with the relative movement in questions 19 - 20 and 27 - 28 away from a teacher-based, compulsory programme, lead me to believe that the technicist paradigm no longer holds sway - at least in the minds of this group of GPs. This belief is supported by the response to questions 31 and 32 which indicate a tendency to move away from "medicine as a science" towards "medicine as an art". I find this of interest in view of the long time [16+ years] since their medical training which at that time, like my own, would have been essentially technicist in nature. There seems to be a decided preference for hermeneutic and critical elements, although, if responses to one crudely-phrased statement may be trusted, postmodernism's constantly questioning nature would not appeal.

The students did not dwell on the way they were being taught apart from saying that they were happy in general with the status quo. They did comment that they were spoon-fed, implying didactic teaching rather than active learning, and that they were conservative, as if to acknowledge that educational styles are changing.

Staff members fell into two camps: those who felt that the current stratified didactic and clinical teaching is adequate and those who have been trying other methods and are cautiously looking forwards to developing a more interactive, integrated and student-

empowering system.

The medical school's mission statement (University of Natal, 1990) includes statements on equity, serving the community, improving community quality of life, community needs shaping the programme, innovative curricula, learning and teaching.

The medical school's Curriculum Development Task Force, formed from representatives of every department in the faculty, formulated a policy statement at the beginning of their endeavours (CDTF, 1997). This took into account the historical aspects leading to the preclinical/clinical divide, lack of co-ordination in terms of the overall aims of the programme and

> a persisting drive towards an unrealistic degree of completeness in the curriculum..gross overcrowding..that..taxes the memory not the intellect. The emphasis is on the passive acquisition of knowledge, much of it to become outdated or forgotten, rather than on its discovery through curiosity and experiment.

The transitional nature of society and of health care was noted as was the importance of holistic and communicative doctor- patient interaction rather than disease management. As to the future,

> The broad aim must be to promote the development of a curriculum..which educates doctors capable of adapting to changing circumstances with minds that can acquire and apply new ideas, knowledge and developments, and with attitudes to learning that inspire the continuation of the education process throughout professional life.. The view that the doctor is a scientist has changed.. New graduates need to have broader vision so that they become more socially aware and socially responsible.

A core curriculum with a circumscribed factual load of essential knowledge, attitudes and skills taught in theme-based units with vertical [preclinical/clinical] and horizontal [inter-departmental/discipline] integration was mooted. Elective modules in a range of clinical, basic science and non-medical areas were envisaged to

> enable students to explore critically and master comprehensively subjects that excite their curiosity.

Neither the mission statement nor the curriculum proposal explicitly sets out the educational framework envisaged, although both show evidence of a willingness to look critically at the needs of society, the individual patient and the future doctor. The student's degree of engagement in his/her own discipline is not indicated. However, an accompaniment (Olmesdahl, 1997) to the curriculum proposal adds details as to philosophy, structure and content. Certain elements such as holism, health promotion, personal and societal issues are themes which are to suffuse programme content.

Motivation and skills for lifelong learning are to be developed by means of student-centred, problem-based, small group learning in a modular structure which accommodates low achievers and allows time for "enrichment activities" for high achievers. Practical clinical skills and generic cognitive skills - acquisition, analysis and application of information - are crucial; access to libraries, computers, subject experts and a clinical skills laboratory will be needed. The need for a staff development programme, working committees to develop and implement the new programme and examine issues such as admissions, assessment and evaluation, a newsletter to keep faculty members abreast of progress, and for modification of administrative structures "to reflect the new curricular paradigm" [my italics] are itemised.

At this point it becomes clearer that the dominant paradigm is changing, in the minds both of practitioners in the field and of those engaged in curriculum reform at the Medical School. Not only are the deckchairs to be rearranged; the ship of state is to alter course. An unproblematised, sterile transmission of information is to become an active, exploratory process with external factors brought to bear. Information is to be sought on a 'I need to know' rather than provided on a 'You have to know' basis. The paradigmatic bearing moves away from technicist through hermeneutic/pragmatic to the critical area of the compass - more so in the light of the liberatory/emancipatory nature of the national Education Department's announcements which make it clear that

> The principle of equity requires..critical identification of existing inequalities which are
>
> the product of..discrimination or disadvantage, and..transformation with a view to
>
> redress. (DoE, 1996, 5)

At this stage the bearing is not directly towards the critical paradigm: input from all stakeholders - learners, teachers, employers, society - into the curriculum has not been directly sought. However, as the reform process continues, students, previously uncommitted lecturers and local GPs have been drawn in. I trust that the findings of my questionnaire will provide relevant input from further afield. The influence of society at large is indirectly brought to bear by means of the reformers' awareness of the Education Department's views and of SAQA's Critical Outcomes which are to be included when compiling curricular material. The views of the relevant professional body (Nel, 1998, follow the Declarations of Edinburgh , Yaounde and Cape Town (Anonymous, 1995) which concur in a global perspective of the doctor whose [outcomes-based] education is student-centred, problem-based, patient-oriented and community-based and whose practice relates to his environment in the attitudes, knowledge and skills he displays. Interestingly, doctors' employers have not hitherto been involved in doctors' education. The Department of Health, as employer of those in government institutions, has no

obvious input. Doctors in private practice were self-employed in the past but as managed health care organisations become more prominent these corporations may become more influential on both practice and education, as they have in the USA.

As asserted above, I feel that postmodernism has not established itself as an educational paradigm as such. It has nonetheless influenced educational thinking and pushed our reflection on what we do and why beyond the communal concerns of the critical paradigm. As we ask what our efforts are doing to empower the individual and to shape society, we are starting to bring to consciousness more fundamental questions such as

Why do we teach / learn?

How have we constructed the process?

What are the relationships underlying it and how are these reflected?

What does it *not* reflect?

How do we use language to convey knowledge?

How are those involved empowered / disempowered? (Usher, 1996, 25-32)

This paradigm's hue, while not obviously suffusing the whole of medical education, is undoubtedly what colours practitioners' thinking when they write about the formal, the informal and the hidden curriculum (Hafferty, 1998, 403) or the intended, the actualised and the unintended curriculum (Nelson et alii, 1992, 202). Here the authors are making explicit the undefined and possibly unconscious biases that influence educational programmes. They draw a distinction between the curriculum which is stated, written, recommended, endorsed, supported and assessed; the taught and learned, interactive, dynamic curriculum; and the structural, cultural and null [what is omitted] curriculum. These three distinct aspects of curriculum are not specific to postmodernism - their recognition, description and bringing to consciousness is what characterises the postmodern approach.

2. Anaesthetics

The discipline's paradigm-by-default has been largely technicist over the years, for reasons of familiarity and inertia. When it became apparent to us locally that a series of attendances in lecture and operating theatres was not stimulating our students and that trying in a two-week block to inculcate the rudiments of anaesthetic practice was futile, we concentrated on generic skills, retaining didactic lectures. For a time, when we had a consultant full-time in the academic department without being tied to the service load in the hospitals, he took the students once or twice a week for interactive tutorials in which they discussed aspects of cases chosen and presented by the students. This is the nearest

we came to student-centred, problem-based learning. This, incidentally, illustrates a point made by Maudsley that many medical schools are claiming to teach in a problem-based manner whereas they are in fact teaching problem solving, or teaching didactically using a problem as an illustration (Maudsley, 1999, 179). As understood by those who hope to instil long-term cognitive skills, problem-centred or -focused or -generated learning, as one might more pedantically call it, entails a 'problem' posited not necessarily to be solved but as a stimulus to the analysis, exploration, discovery, understanding and application of issues and related knowledge arising out of the 'problem'. Our tutorials required a minimum of active participation by the students and probably did not help develop independent study or logical analysis to a significant extent.

The introduction of an OSCE [Objective Structured Clinical Exam] with simulated patient scenarios, and of written case reports with comments, as end-of-block assessments made us feel at the same time more progressive and more pressurised [relating to our clinical service load and lack of dedicated teaching time - a dilemma common to medical educators in this country]. Judging by student feedback, they enjoy the hands-on aspects of their fortnight but are frustrated in terms of what they think they should be learning.

3. Paradigm shift or slide?

It has become a commonplace that we are seeing a "paradigm shift" in medical education at present. For instance, four changing circumstances have been noted (Morrison et alii, 1993, 62): economic, technological, emphatic and ethical - although only the third is referred to as a paradigm shift. This shift is

..from the belief that disease can be conquered to the idea that good medical practice should keep the majority of the population healthy, productive and out of the hospitals.

Several areas of instruction are mentioned, as are a requirement for research and teaching to be distinguished and equally rewarded, but no change in teaching is delineated.

Similarly, a political economist (Ginsberg, 1993, 519), examining medical educational reform, speaks of

a paradigmatic shift from deterministic prognosis to clinical epidemiology...with attention shifting from the presenting patient to population-based probabilistic evaluations and treatment modalities.

He writes that this shift is called for but observes that enthusiasm and investment in such an innovation are insubstantial and holds out little hope of progress over the short or medium term.

Another author (Rabkin, 1998,127-131), using and defining the term 'paradigm shift' as coined by Kuhn, details twenty-five areas of change, ranging from philosophical through institutional and patient care to pragmatic factors - many of them overlapping with those of Morrison et alii. He notes two "compelling phenomena" in particular: the changing economic environment and advances in health care [in America], and argues that the aggregate amounts to a Kuhnian shift. Again, no specific change in teaching is described.

A plaint is noted from 1876 about the overloading of the medical student to the point of obstruction of sound knowledge acquisition in favour of "the crammer and the grinder" (Buckley, 1993, 113). The writer comments on a report from an more recent American medical education commission which included a paper pointing to a paradigm shift in the biological sciences which resulted in a blurring of traditional divisions between basic medical sciences, and in advances in therapeutics. Information science and public expectations have also changed so as to influence medical education. Little is said of education itself, other than that the community beyond the confines of tertiary care hospitals should be included and that examinations should be interdisciplinary.

A summary of aspects of the second World Conference on Medical Education, while not mentioning paradigm shift explicitly, refers to changes in the world as a whole and "unprecedented changes" in medical science and practice, singling out

> exponential increases in health-care costs in the developed world and remarkable rises in life expectancy in developing countries. (Warren, 1993, 488)

In similar vein, the preface to reports on a conference on improving social responsiveness alludes to "..a revised paradigm.." and "..the changed paradigm." when looking at medical schools being proactive in shaping more accountable health systems (Ayers et alii, 1999, Svii). The writers mention as background the traditional model of teacher-centred instruction with separation of basic sciences and clinical disciplines, and the problem-based, student-centred "biosocial" model.

In Canada, Hansen & Roberts write of a shift in emphasis in medical education arising from both profession and public examining the assumptions behind the research-based model of undergraduate education. They mention consideration of community needs, health care costs and

> ..a fact-crowded curriculum with insufficient emphasis on the human dimension and on humane values.. (Hansen and Roberts, 1992, 136)

as influences on doctors' education. They describe the unease in an academic community during a paradigm shift, evidently considering the areas mentioned to be contributory to such a shift.

They go on to allude to

> Facilitating learning rather than imposing instruction..

on the part of faculty members and to

> ..active learning..linking new knowledge to prior knowledge, and..learning in the context
>
> in which the information will be used in the future

on the part of students. These writers delve more into strictly educational aspects than those previously mentioned; they attempt to define scholarship, describe examples of educational research and, like Morrison et alii, suggest that recognising and rewarding scholarship in teaching would serve to diminish the marginalisation of medical educators.

While these authors all speak of a paradigm shift, they refer in the main to shifts in external factors which may influence medical education; of perceptions which may be symptomatic rather than causative of change. Hansen & Roberts do give examples of educational changes that imply a move away from the sterile technicist approach at least through the hermeneutic and probably into the critical. The concern of the other writers with external influences certainly suggests a more critical engagement with their subject. My impression from these authors [all North American] is that there is too great a momentum behind medical education for it to pause and examine its basic assumptions in a postmodern manner. Rabkin specifically refers to Kuhn and infers that the number and degree of the changes he notes add up to a revolutionary change. The other users of the term 'paradigm shift' do not clarify whether they mean more than an ill-defined change of view or evolutionary slide from one perspective to another, or whether they would characterise the shift they describe as a wholesale revolutionary displacement of one shared set of values by another.

Educational strategies

A number of strategies have been presented in the literature and in our local and national context as being worthy vehicles for educational reform. In view of comments made in the literature and by respondents, I feel it necessary to explore some of the strategies suggested and to explain my rationale for using the SPICES model as an investigative tool.

1. National context - outcome-based education

Despite the upheaval in education in this country at present (Brand, 1999, 2) (Fisher, 1998, 121) (Asmal, 1999, 2-3), the majority of GPs agreed that this is not the wrong time to be making changes - a fact accepted, if hesitantly, within the medical school. However, a substantial minority of GPs felt that matriculants would not be able to cope with a system requiring them to take responsibility for their own learning; statement number 18 in the questionnaire was the one which drew the most equivocal spread of responses. This aspect has been an concern oft-voiced in a number of quarters at Medical School. Primary and secondary education are in ferment and, at least in the short term, university matriculants are likely to continue to come from a system of rote learning which will not prepare them for the challenges of self-directed learning. This may be an problem particularly of our educational heritage - although I note the difficulties experienced in the USA with the introduction of outcome-based education (Pliska and McQuade, 1994, 66), (O'Neil, 1994, 7), (Zitterkopf, 1994, 76) despite documented success in that country (Evans and King, 1994, 16). Jansen early on voiced his doubts about the feasibility of OBE in South African schools (Jansen, 1997a, 1-9). Of ten reasons for concern, he highlighted unrealistic claims, inaccessibility of vocabulary and underpreparedness in the classroom environment (Jansen, 1997b, 1). In a critique of what is seen as a hybrid of OBE and competence-based education in our schools (Harley and Parker, 1999, 181, 190-191), a point relevant to higher education is made: that a collapse in traditional subject boundaries makes for relational problems between teachers and between teachers and students. Hamilton writes of the necessity in medical education for outcomes to be wider in scope than the immediate details of traditional content; understanding of health care systems, biogenetic medicine, integrated care and multiculturalism are areas that should be included. In the same vein, the time line of outcomes should be extended beyond the end of the undergraduate programme; internship and the years of professional practice must be planned for. Simultaneously, in

step with the external progression through the curriculum and beyond, the inner aspects of motivation, morale, values and integrity, equanimity and other personal attributes may need to be addressed more explicitly (Hamilton, 1999, 125-126).

2. Self-directed learning

Even in countries where the standard of education is more uniform and the quality presumably higher, increased autonomy for the learner is not unproblematic. Candy describes the

> uneasy feeling that not every learner is willing, or able, to accept the responsibility I am prepared to share. (Candy, 1987, 159)

He recalls that Carl Rogers noted that between a quarter and a third of learners are self-directed and that Wispe found, among students with differing learning styles subjected to differing teaching environments, that the group wanting more direction but treated permissively was the most dissatisfied. Candy questions whether it is as unethical to force a student into a self-directed mode if unprepared as it is to deny freedom if that is demanded. However, he suggests that a preference for dependent learning is itself learned - which implies that it can be unlearned. He adduces some circumstantial evidence: learners in exam-orientated institutions seem to prefer more directed teaching, as do those in a new field. [My own experience coming from Medicine and starting to paddle in the deep waters of Education certainly confirms this.] Kreber (1998, 84) suggests that while psychological type may be indicative of learning style preference - extroverted intuition being a strong predictor for self-directed learning - intuition and thus self-directed learning can be encouraged, preferably within the framework of Kolb's (Kolb et alii, 1984) experiential learning cycle. [Interestingly, it has been pointed out that many of the features of the 'new' problem-based learning have been applied in Talmudic schools for millennia (Notzer et alii, 1998, 509), and that we each learned in a problem-based fashion, for example when we first learned a foreign language [our mother tongue] on our own (Ludvigsson, 1999, 127).]

It is apparent that the jumping-off point for our students, the nature and quality of their secondary education, about which reservations have been expressed, may prove to be a major stumbling block. In South Africa, it has been claimed that

> ..there is much evidence to show that students' previous experience is more influential than innate ability. (Donn, 1996, 5)

and again,

..an articulation gap between the demands of higher education and the preparedness of school leavers..

has been noted (Grobbelaar, 1997, 7); this carries implications particularly for us, and quite likely for other higher education institutions in the country. McMaster University in Canada, as a pioneer of self-directed learning, has indicated that even after having chosen students suited to it, particular care is taken with choice of tutors during the first year so as to guide and foster self-directed learning (Hamilton, 1976, 1192). The care with which our first-year students' introduction to the new curriculum and new style of learning is being planned is certainly justified. One of the students interviewed asked why we could not just make science subjects at matriculation level an entrance requirement as in the past; as secondary school pupils have to choose their subjects, they should choose those which will lead to the higher education course in which they are interested. McMaster accepts students without science backgrounds but assesses their aptitude for self-directed learning prior to entry. In our medical school, given the intent of the government to broaden ["massify"] the base of higher education (DoE, 1997, 4), (Asmal, 1999, 10, 11) the faculty is reluctant to specify conditions of entry which might penalise disadvantaged students. We are aware that many high school pupils may not be offered science subjects due to lack of resources. The state of preparedness of matriculants will continue to be a major concern for some time.

The University of Transkei's medical school since its establishment in 1984 has pursued a student-centred, problem-based, horizontally and vertically integrated curriculum revolving around small group work with tutors [one clinical, one basic science] and self-directed learning (Iputo and Nganwa-Bagumah, 1996, 650). Implementation problems commented on include the changed role of teachers from instruction to facilitation and a need for extra commitment from both students and faculty (Buga, 1998, 1418). No mention has been made of problems arising from the nature of students' educational backgrounds.

Problem-based learning has been applied in nursing education at the University of Natal and elsewhere in this country (Cassimjee and Brookes, 1998, 95), (Bitzer, 1997, 8), (Dana, 1997, 42). Orientation to the new mode of learning was seen as a problem for students even at Master's level. This presumably relates to students' prior educational experience.

On questioning our own students they seemed content with the current didactic teaching. When challenged about their retention and application of preclinical material, they were in

favour of a layered curriculum, counting on preclinical material being revised during the clinical years. [They seemed content to forget what they have not retained.] They were not happy about the idea of searching out their own information and the possibility of having tutors who were not subject experts. They recognised that education in schools is also undergoing profound change and surmised that future generations of students are likely to be more accustomed or adaptable to what is at present an unknown and unwelcome innovation. A number of comments centred on uncertainty caused by lack of direction by teaching staff inasmuch as requirements or expectations were not being spelled out.

The hilt of the thrust towards self-directed, co-operative, reflective, on-going learning is of course our choice of 'Problem-Based Learning'. Since its inception some three decades ago, the number of its adherents has gradually increased, to the point where its adoption is being advocated on a widespread basis in Britain (Lowry, 1992a, 305-306), (GMC, 1993, 11), North America (Ross et alii, 1999, S21), the Netherlands (Prof. Anton de Goeij - personal communication) and by the World Federation of Medical Education and the World Health Organisation (Finucane et alii, 1998, 445). The accusation of "climbing on the bandwagon" or "change for the sake of change", which has been implicit or explicit in a number of comments locally and internationally, is the spearpoint of a counterattack based on the difficult-to-rebut query "What is wrong with the system which produced me?"; the "If it ain't broke, don't fix it" school of thought (Shumak, 1992, 1152), (Kaufman et alii, 1989, 293), (Staff Interview 1 [Appendix 2d]). This may be passed off as a reactionary parry but many of those who pose the query in one form or other give every evidence of being prepared to accept the bona fides of those knowledgeable in educational matters but of wanting reassurance that the direction we are taking is appropriate - "Is there such a thing as Evidence-Based Education?" (Appendix 2b) Problem-Based Learning is hafted firmly in the hermeneutic paradigm in terms of allowing students to form their own interpretations of the knowledge they accumulate. The problems around which they will structure their learning will relate to the society in which they will practise; I see this as a firm move into the critical paradigm. The idea that little is taken for granted, that all is open to question, has a postmodern edge but this is blunted in reality by the fact that problems and associated learning objectives are circumscribed by the committees designing the modules and by tutors' guidance of their students' deliberations.

It seems generally acknowledged (Dolmans and Schmidt, 1996, 538), (Finucane et alii,

1998, 447), (Thomas, 1997, 327-8), (Schmidt, 1998, 430) that the educational evidence to support the claims made for, and expectations of, Problem-Based Learning is not yet overwhelming and that the larger question of whether it produces better doctors is not going to be easy to answer. Certainly, the majority of published opinion is favourable but naturally this stems from its proponents; this would not be the first time in medicine that enthusiasts have made claims - based on scientific trials - which lengthier study has tempered. Recently an academic at McMaster - one of the schools at the forefront of PBL - took an objective look at the theories of adult learning upon which so much has been founded and suggests that the "Adult Learner" may be a mythical species, since the "axioms" on which the theories depend have not, to that writer's knowledge, been examined empirically (Norman, 1999, 887). A paper implying that PBL may have been superseded has already appeared (Papa, 1999, 160). It remains to be seen whether the paradigmatic elements represented in PBL will continue in that particular shape, or whether, with the benefit of further experience and reflection, a more objective viewpoint and further research into teaching and learning, they will be re-moulded, enlarged or reduced, and propounded in entirely a different format.

3. Exploration of educational strategies

The acronymous SPICES model of curriculum (Harden et alii, 1984, 285) was propounded as one extreme of a spectrum of educational strategies, the other end of the spectrum being more traditional:

Traditional curricula		New curricula
Teacher-centred	-------------------------	Student-centred
Information-gathering	-------------------------	Problem-based
Discipline-based	-------------------------	Integrated
Teaching Hospital based	-------------------------	Community-based
Standard programme	-------------------------	Electives plus Core
Apprenticeship / Opportunistic	-------------------------	Systematic

This sixfold division is pragmatic rather than theoretical and indicates the direction in which curricular innovation tends to move - from positions on the left towards positions on the right. It was suggested that, although the elements are interrelated, it would be helpful to consider each separately to gain a profile of a particular curriculum rather than view it as a monolith to be regarded as either 'traditional' or 'new'. A piecemeal

approach might reduce a tendency to reject a new scheme in its entirety merely because one aspect seemed inappropriate, would make areas of progress easier to pinpoint and would aid understanding of the issues involved in educational development.

It seemed that such a profiling device could be used in our circumstances - although the apparent shifts measured in this study represent GP opinion in terms of their memory of their own training compared to their expectation of what the ideal training might be. The separate continua, in the GPs' opinion, showed differing degrees of movement. Two of the continua [Information accumulating - Problem-based and Hospital-based - Community-based] showed trends towards the 'New' ends which did not reach statistical significance. This may be partially due to the spread of opinions, represented by the size of the standard deviations relative to the means. More fundamentally, it may be related in the case of the first-mentioned continuum to the fact of problem-based learning being an unknown quantity [It may be recalled that, of the initial group of questions, № 18 showed the narrowest margin between agreement and disagreement with the statement "High school matriculants would be able to cope with more responsibility for their learning"]. In the case of the Hospital - Community continuum, the perceived patchy state of health care provision outside teaching hospitals and lack of a tradition of teaching by community-based health professionals may have contributed to a less than wholehearted move towards reliance on community-based teaching and learning. One of the continua [Opportunistic - Systematic] showed movement in the opposite direction from the others. It appears from telephoning some of the respondents who indicated a large move from right to left that this reflected a wish to retain the use of clinical material which they felt would not be adequately represented otherwise. While overall there was a significant shift towards the right, the mean measurement for the 'ideal' was barely over the halfway mark: 51 mm [cf. 39 mm for respondents' own training]. This implies a degree of conservatism despite a feeling that change should take place. The ability to assess such a shading of notions confirms, I think, the intent of the propounders of the model: that it allows for an expression of opinion more nuanced than acceptance or rejection of a 'package' or indeed of a particular element of a package. Direct comparison with equivalent opinions amongst the staff and students within the medical school would have been interesting but, as mentioned above, it was felt to be strategically inauspicious in terms of the curriculum reform process to circulate a questionnaire this year. Similarly, comparison with profiles of other medical schools nationally and internationally would be intriguing. A workshop involving several Eastern Mediterranean medical schools showed that for the first and last two continua they rated themselves very close to the traditional end but that there was some spread towards the SPICES end for the other three: Problem-

based, Integrated, and Community-based (Tekian, 1997, 218). The SPICES model has been applied in England by an individual [clinical] department (Dent, 1993, 1410) progressively over the six continua. No figures are given to document the changes, but the writer records that

> The.. changes in emphasis have been appreciated by the students, who are now more
> actively involved in their own learning.

The seventh visual analogue measure [GP Questionnaire Q 31 & 32] is unrelated to the SPICES concept but is an interesting area in medical education with a similarly nuanced spectrum. I thought that, in parallel with what seemed to be a shift away from the natural science paradigm, a move away from the conception of medicine as a science would be likely. One encounters in medical education journals mention of requirements to take a humanities course (Schwartz et alii, 1999, 677), (Editorial, 1971, 1358), of an elective in Literature and Medicine and a sponsored student journal of poems and essays (Poirier et alii, 1998, 473), of books written by students about their medical school experiences (Conrad, 1988, 323), of efforts to "humanise" medical education by including "..study of history, literature and the arts. Classic [sic] studies.." (Morrison et alii, 1993, 63) and of the success of students without a science background (Ferrier and Woodward, 1983, 72, 76-77) - all suggesting that a scientific bent is no longer considered mandatory. It therefore seemed worthwhile to attempt to assess any tendency in this area in our province. Comparison of the mean visual analogue scores for my respondents' own training and their ideals showed a [non-significant] trend towards the 'art' end but remaining on the 'science' half of the line, implying that amongst this group of practitioners medicine is still seen as firmly rooted in the sciences.

Curriculum content

1. Depth

The majority in practice feel that, while facts are not everything, they would wish as much as possible to be taught - despite the feeling that too much specialised information was taught and that more is used in practice than was taught at medical school. Similarly, with reference to anaesthetics, the demand is to be taught a substantial amount - if not the whole - of the discipline itself; this has been echoed by the staff members interviewed and over the last two years by undergraduates indicating their expectations of the Anaesthesia module [Appendices 4b, 4c]. The anxiety to leave no stone unturned has been dubbed "coveritis" (Guilbert, 1998, 67) and has undoubtedly been the cause of the content overload which has formed the refrain of so many commentators over the years. In our medical school, the reality seems to be generally accepted that we cannot continue to cram in all that we would like. The Department of Anaesthetics acknowledged that fact some years ago and we specifically excluded the teaching of the gamut of anaesthetic practice and restricted ourselves to principles and generic skills. Positioning ourselves deliberately as a postgraduate discipline relieves us of the compulsion to squeeze as much as possible into the undergraduate curriculum and this has released us to assess what generic competencies we can offer to the generic doctor. Being a relatively minor discipline, we have had the freedom to experiment without feeling that a generation of patients may be significantly disadvantaged by what we teach or fail to teach to our students.

We do not address the oft-repeated plea to turn out graduands who will immediately be able to administer anaesthetics. Given that the practice of anaesthesia requires a degree of clinical maturity and at least six months supervised experience (SASA, 1999, 1), a lesser period of undergraduate exposure would be likely to provide only that "little learning" which is a "dang'rous thing". Indeed, a like debate simmers at postgraduate level: it has been suggested that post-internship doctors in their "community service" year might rotate through anaesthetics for three months; this has been resisted on the grounds that they will gain enough expertise to be a danger but not enough experience to be safe.

It is increasingly being realised that any form of medical practice requires a term of training (GMC, 1993, 6), (Schwartz et alii, 1999, 675) and that conferral of a medical degree does not imply conferral of competence to practice or possession of all the skills expected of a practitioner. In this country, the suggested extension of internship to two

years plus the "community service" year would provide much-needed time to acquire clinical competence and practical skills. The realisation that all of medicine needs to be shoe-horned into five years, plus the provision within the proposed new curriculum for elective study periods during which interest in a particular discipline may be pursued, may help other departments to follow Anaesthetics' example in paring down to knowledge, skills and attitudes applicable over a wider field than their own discipline.

2. Breadth

The Curriculum Development Task Force based its selection of core aspects of medical knowledge on the Department of Health's initiative to compile an Essential Drug List. The latter was based on an assessment of the most common medical conditions in the country. Around this basis we structured submissions by the faculty's various departments of their disciplines' core knowledge and from this the modules of the new proposal were constructed. Since questions 33 to 67 of my GP questionnaire were in turn based on those modules, it is not surprising that, on average, every area was rated in the upper half of the range of responses. Indeed, this part of the questionnaire could be regarded merely as confirmation that general practice in this province conforms to the pattern in the country as a whole. I was gratified [as a member of the Curriculum Development Task Force] to see that our choice of material was largely affirmed. Specific comments made by the GPs [Appendix 1e] further affirmed the choice of subjects to be included in the various modules - these were not spelled out in detail as this would have made Questions 33 - 67 far more extensive and perhaps have discouraged completion of the questionnaire. Virtually all the items mentioned had been included in the proposed new curriculum. Coming from practitioners in the field, the breadth of subjects suggested is both refreshing and encouraging: Cultural aspects, Communication and Language skills, Computer expertise, Business skills, "Alternative medicine" - these all represent a broadening of focus beyond the traditional natural, medical and clinical sciences. An awareness of the doctor's place in society, a feeling that GPs could and should be involved both in shaping the process and in teaching the students, the necessity for awareness of the changing medical needs of the population and that basic science and clinical disciplines should be integrated are all intriguing indications either of the actual felt needs in the field or possibly of a more sophisticated grasp of world-wide developments in medical education than might have been expected. Since undergraduate medical education does not loom large in the country's medical publications and since similar suggestions were not uniformly put forward by medical faculty members when interviewed, I am inclined to believe that these suggestions are genuinely reflective of conditions and needs in general

practice.

At this medical school, as elsewhere, the issue of paring content to a core appears not to be problematic, although, even within one country (GMC, 1993, 9; Kaufman et alii, 1989, 294), the core may differ between medical curricula. Harden and Davis (1995, 129, 136) and Bligh (1995, 383-385) provide helpful criteria and strategies for determining what the core should be.

3. Positioning of anaesthesia core content

While the Curriculum Steering Group were assembling areas of cognitively-linked knowledge, each department submitted its core material. Our elements [as represented in the Anaesthetics section of the GP questionnaire] were fitted in where appropriate - in twelve different areas [out of a total of thirty-one multifaceted modules spread over the five year programme]. My understanding is that we may be approached to provide teaching material and/or teaching skill for those portions peculiar to our expertise. In areas where our submissions overlap with those of other departments, the latter may well teach those aspects, or teaching may be shared in a multidisciplinary fashion. The relative weightings of elements of anaesthesia implied by the GPs' responses to my questionnaire [Appendix 1g] are intriguing, considering that they were asked "As relevant to general medical practice". Care of the Unconscious Patient, CardioPulmonary Resuscitation and Preparation for Anaesthesia & Surgery are items for which anaesthetists are traditionally called in the hospital setting. GPs also appear to appreciate the need for training in these areas. Intravenous Fluids and Acute Pain are items which the GP may often need to manage. Because of our attention to the patients' breathing [or lack thereof] in theatre or intensive care unit, I should have expected Respiratory Support to feature more prominently than it did; the higher ranking of Cardiovascular Support perhaps reflects a concern for management of cardiac events seen in general practice rather than in theatre or ICU - e.g. myocardial infarction, congestive cardiac failure, etc. The ranking of Intensive Care lowest on the suggested list undoubtedly reflects minimal GP involvement with what has become a superspecialty. The low ranking of Death and Bereavement may portray not so much a lack of concern for the subject but either the fact that such a topic is a relatively new[!] addition to medical education or that anaesthetists are not expected to teach it.

At no point in the proposed curriculum does "Anaesthetics" feature - indeed, no individual discipline appears, except in the fifth year when seven major undergraduate disciplines appear as such. [This traditional clinical clerkship year has been retained as a

compromise with those who argued for a period of integration of thematic knowledge within specific disciplines in which newly-qualified doctors would find themselves working during their internship.] The GPs considered, 40 to 4, that we should teach Anaesthetics, and the staff members interviewed also claimed that there is a place for the discipline as such - albeit on somewhat vague grounds. I did not have time to pursue this line, but further probing might well reveal that the desire for Anaesthetics to be represented is no more than a wish for individual elements to be covered; the examples given were in each case elements of our core - practical or theoretical. Another possible reason for wanting a disciplinary presence might be that of solidarity in the face of a mutual threat to autonomy. I made it quite clear that my study was personal, that contributions would be anonymous as to department and individual, that I had no hidden agenda and that the information was not being sought by any other body. Nonetheless, there may have been a perception that if the disappearance of one discipline from the undergraduate curriculum were countenanced, others could follow. An expressed desire to see Anaesthetics as part of the whole may represent a closing of the ranks in the face of the enemy - namely "They" who are held responsible for the reform process.

The Anaesthetics department will no doubt put together a module to be offered as an elective. This will to an extent address the concern of those who wish the discipline to have a presence at undergraduate level, although our core content, or a research project, rather than all of anaesthesia, will no doubt be the gist of such an offering. We share with other departments the fear of time overload, despite reassurance that student contact time will be reduced because they will be directing and pursuing their own learning. We have already been asked to participate in a module in the first year, detailed planning for which has begun. We may be approached as individuals to act as small group tutors/mentors in this or other modules.

4. Integration of content

Problem-Based Learning appears as a rule to have been applied to medical education using content integrated horizontally between disciplines and vertically across the basic science / clinical divide. While it has been suggested that PBL can be used within the confines of a single discipline, it is difficult to envisage how one would avoid students' enquiries spilling over into other disciplines. Studies in preclinical sciences would continually beg the question "How does this relate to clinical practice?" and in clinical disciplines, even assuming that the relevant basic science had already been learned [and retained], questions about related areas in other disciplines would be bound to arise. The survey at this medical school in 1992 (Manning et alii, 1995a, 2-4) showed that senior students'

perceptions of their ability to recall preclinical subjects was poor except for Clinical Signs [86%] and Pharmacology [59%], which were felt to be the most relevant [93% and 94% respectively] of the preclinical subjects. Lecturers in the clinical years had a uniformly poor impression [ranging between 11% and 28%] of students' ability to recall and apply previously taught knowledge. The lecturers felt that at the time of graduation students were not able to seek out information for themselves or to differentiate between core and trivia. Only 48% of lecturers agreed that students had acquired the appropriate knowledge, skills and attitudes to identify and manage life-threatening conditions in South African contexts. This was confirmed by a simultaneous survey of graduates (Manning et alii, 1995b, 3) who denied that the layered curriculum was good [38% 'not good'; 30% 'good'] but claimed that they could learn and retain from one year to the next [44% agreed; 33% disagreed]. They substantially agreed that clinically relevant problems in the preclinical years would enhance teaching [89%] and motivate students [92%]. There was less marked agreement with statements on their ability on qualifying to grasp principles, think independently and exchange information. A statement on ability to practice amongst different types of community drew the most disagreement [49%]. More recently, a survey of second and third year students at this medical school (Olmesdahl, 1999, 176) elicited suggestions that material be moved down to first year, that course design and implementation be varied and that some material be reduced if not eliminated.

Against such a background the comments of the students to whom I spoke this year are particularly interesting. They felt that the basic sciences should be taught prior to clinical experience and that repetition of the material they had not retained was an effective learning method. The idea of learning material as and when it was needed did not appeal to them; nor did self-directed learning. They were hoping that in the next year or two they would pick up practical skills in an undefined way. There was a grudging acceptance that change was inevitable and that subsequent generations of students would be better prepared for the new learning methodology - this perhaps is an encouragement to continue our reform process in the hope of addressing the problems highlighted in 1992. The staff members interviewed exhibited varying views. While not specifically asked, two indicated that integrating teaching with other disciplines was important to them. One implied that integration might actually pose a threat to those non-medically-trained members of his department whose fields could be taught by clinicians. The tenor of reports on PBL (Norman and Schmidt, 1992, 560), (Kaufman et alii, 1989, 289) is that integrated curricula yield less knowledge of basic sciences but may improve long-term retention and increase uptake of clinical competencies. While a number of writers (Bernstein, 1996, 25), (Iglehart, 1997, 756) have mentioned the political aspects of

penetrating the hermetic seals between traditional disciplinary fiefdoms, I, as a non-executive member of a clinical department, have found the experience of working with members of other clinical and preclinical departments enriching and invigorating. However, the threat - real or perceived - to departmental empires is a factor which may prove problematic in our medical school, as in others with a strong disciplinary structure and little experience of multidisciplinary work.

Aspects of change

1. Influences towards change

As alluded to previously, a number of influences have bearing on this medical school. There are changes in the theory of education brought about by developments in educational research. There are changes in the nature of society which influence how we interact with those we are attempting to educate. There are changes in medical education internationally. There are changes in thinking about education in this country which are being brought to bear upon us just as on educators generally in the fields of primary, secondary and higher education. Changes in the outlook and philosophy of our university are of influence, as are pragmatic matters such as the numbers of students and the financial load entailed in educating a future doctor. To say with our current students "We are conservative" or with some of our colleagues "Why try to fix something that works perfectly well" and "This all comes from America" is to acknowledge the existence of inertia rather than to deny that any impetus to change exists. On the other hand, the accusation that this medical school's curriculum reform initiative represents "change for the sake of change" is one which deserves serious consideration - Petronius was neither the first nor the last to observe the propensity to mistake [or to substitute] change for progress. One may doubt the relevance of some of the influences thought to bear on the reform initiative and one may determine to respond to others in a strategic rather than a truly innovative way - the fact remains that in the literature and in studies in our medical school a number of theoretical and practical considerations have been documented which perhaps could be resisted but which are nonetheless pertinent.

2. Necessary conditions for change

Given that a groundswell of movement towards change in medical education is demonstrable; why is it that for at least the past century change has been urged but has not occurred? Examining this question in the context of a American initiative to train more generalists and taking a leaf from a business school study of organisational change (Kotter, quoted by Brooks et alii, 1999, S4), eight stages in the process of change of an organisation have been described:

Establishing a sense of urgency

Creating a guiding coalition

Developing a vision and strategy

Communicating the envisioned change

Empowering broad-based action

Generating short-term achievable goals

Consolidating gains and producing more change

Anchoring new approaches in the organisational culture

The point was made that successful change goes through all eight stages, not necessarily in the same sequence, but that omitting any stage usually creates problems. It may well be that observations made in the sphere of business have little or no application in the spheres of academia or medicine, but development described in terms of these stages, and other case studies, suggest that a number of these steps are pertinent to medical education reform.

In a study of several medical curriculum committees, reference is made to another investigation of organisational change (Hage & Aitken, quoted in Hendricson et alii, 1993, 187). Four phases were identified:

Need for change sensed by numerous components

Concrete plan, palatable to power brokers, evolves

Plan implemented in piecemeal fashion

New plan becomes routine or terminates

The knowledge, blessing and active leadership of the organisation's chief executive were emphasised as crucial to success. The curriculum committee study reveals leadership by the dean, faculty commitment, support of respected senior faculty members, involvement of staff in general and student lobbying as important factors promoting change. Conservatism, departmental autonomy, lack of curriculum committee authority, ineffective planning and blaming students for problems are mentioned as impediments. Another work cited (Levine, quoted in Hendricson et alii, 1993, 188), listed five forms of innovation of which three are thought relevant to medical schools: holistic, enclaving and piecemeal change, the first being the most wide-ranging, difficult to prosecute and needing unanimity amongst stakeholders.

A case history of an "educational experiment" (Kaufman et alii, 1989, 293) quotes as barriers to change:

Fear of loss of control

Comfort with the status quo

Promotion based on research and service rather than on teaching

Seeing innovation as too costly in time, money and resources

Strategies to overcome the barriers are also grouped into four areas:

Developing broad ownership of proposed innovation[s]

Inviting participation and winning converts

Broadening the base of support

Sharing the rewards of change

Further points are made; innovations invariably touch on issues outwith the medical school and broader support for change is likely than within academe itself; alliances with such constituencies may bolster reform efforts. Furthermore, attention to the political environment of the medical school may be as important as the details of the curriculum change[s].

An ongoing forum on academic medicine [in the USA] has covered a great deal of ground during the past three years. One intriguing point made (Iglehart, 1997, 758) is that

Success builds a degree of inertia that makes dramatic transformation absolutely necessary..Until a sense of crisis is felt by the leadership, the sense of denial is so strong that movement will not occur

- a paradoxical viewpoint that perhaps answers the oft-posed question "Why fix it if it ain't broke?". The implication is that problems are denied up to the juncture that the accumulation of issues requires radical rather than gradual modification. On another occasion, a participant remarked

I believe there is a tremendous amount of resources lost to frictional energy in our academic medical centres today which would disappear if they operated in a more integrated way   (Iglehart, 1999, 768)

This is yet another reference to the importance of the politics of an institution as regards changes that may on the surface appear unproblematic.

A report from the 1993 World Conference on Medical Education (Warren, 1993, 488) documents widespread changes in the science and practice of medicine and promises to provide all medical schools with advice on "..how to achieve change in the conservative environment of medical education". While no details of the advice are given, the implication is made that conservatism is perceived as a problem requiring help.

In Australia, a keynote address on Quality Learning in Clinical Settings (Kamien, 1993, 226) mentions amongst more obviously educational aspects that

Medical schools are not particularly happy places, partly because so many of the faculty feel disenfranchised by the power of veto of one or two large departments.

The speaker comments favourably that at McMaster, the curriculum is owned by the faculty as a whole with individual departments being unable to act as "feudal warlords"

and argues for the financial and executive clout of the dean to be increased, his/her "vision, negotiating skill and fiscal power" being crucial in several innovative American medical schools studied.

It seems from the foregoing that the decision to alter part or all of a curriculum is merely one point in a continuum of process towards achievement. The need for change must be perceived not only by an individual enthusiast or even an avant-garde group but by a wide cross-section of role-players, including those who carry sufficient moral and monetary suasion. Practical means to achieve the end must be apparent and appropriate strategy and tactics employed to make the possibility of success apparent. It is perhaps because of failure to address the perceptional and political facets of the matter that medical educators have failed, since Osler in 1903 advocated "Radical Reform" (Osler, 1903, 49), to get that reform moving. Looking as an instance at our own medical school in terms of Kotter's eight stages: while a guiding coalition, a vision and strategy, and communication of the envisioned change have been worked at, it is not clear that a critical mass of the faculty feels a sense of urgency or feels empowered to make a change. Indeed, it may these last two areas which have, in the breech, stultified medical education reform around the world for a hundred years.

3. Degree of change

I have summarised previously the views of several authors who write implicitly or explicitly of educational change in terms of a change of paradigm. Although one pair of authors describe Kuhn's concept of paradigm change, it is not clear whether the others use the term paradigm in that sense or in the curriculum theorist's sense of the different educational paradigms - or indeed whether they use the term as so many do nowadays to mean a different but not necessarily opposed point of view. As so often is the case, those at the coal-face, writing out of their own experiences and perceptions, do not always anchor their observations in the neat categories that theory proposes. My own perception, from what I read, is that Education as a discipline has become aware over the years of an evolution in paradigm from technicist through hermeneutic to critical, that this evolution has paralleled - though not been contemporaneous with - evolving notions in philosophy and in society in general, and that, just as certain aspects of philosophy and social life coexist with both older and newer aspects in a continuing growth, when one comes to examine a particular educational system, whether in micro- or macro-cosm, one finds aspects of different paradigms rubbing shoulders rather than being kept strictly apart.

In medical education, which over several centuries has built up a massive momentum, and which has been erratically guided - rather than actively steered - by influences from within its profession and from its wider contacts and responsibilities, the gradual evolution in education has gone unnoticed until comparatively recently. A number of authors have referred - often with disapprobation - to the emphasis for at least a hundred years on the research orientation of medical schools and the accumulation of scientific facts that the medical student has had to ingest for regurgitation at appropriate junctures. It is hardly surprising that, as natural science / technicist teachers, when we look around us at postmodern society and philosophy and concomitant influences on education theory and practice, we experience something of a wheel-spin in belatedly getting up to speed with the theory and praxis of contemporary teaching and learning. One may debate whether the sequence Technicist $\rightarrow$ Hermeneutic $\rightarrow$ Critical [? $\rightarrow$ Postmodern] represents an evolutionary or a revolutionary [Kuhnian] progression; for those of us jumping from the first to the last element, not having noticed the intervening steps, a Khunian wrench in our understanding of teaching and learning is being experienced.

If I may be allowed a personal anecdote: for me, a moment of insight occurred during a staff development workshop when a cartoon was used as an illustration. A boy is telling his dog about the purpose of his leash but in the final frame of the sequence when he asks the dog to repeat what he has said, the dog replies: "I don't have the slightest idea." This made the point that when I present information in a unidirectional technicist paradigm and assume that Teaching = Learning, I do not know whether the information has actually been received until the moment when I assess my students. If they reproduce what I originally presented, I assume that my teaching was successful; if they do not, I have no way of knowing where the interruption in the pathway occurred - whether at the point of my decision on what is important, in formulating the information, in the vocabulary with which I expressed it, in the background and experience of the listeners, in their interest in and receptivity to the subject, in their understanding, in the way they fed the information back to me when I assessed them, etc. To address all these aspects, I need to involve my students in planning an educational experience, I need to examine the preconceptions which I and they carry which may be different or even opposed to one another and I need to be aware of expectations on the part of the institutional teaching/learning environment and of the wider society which supports our endeavours and hopes to benefit from them.

If we are to produce an end product whose education is relevant to his/her aspirations and needs and to those of the society on which we are founded, the changes demanded

of us are of such a degree - whether due to our own intransigence and inertia or to a sudden acceleration around us - that we perceive them as a Kuhnian paradigmatic revolution: a new system displacing an old; rather than as a gentle transition from one view of education to another.

Content vis-a-vis paradigm

A preceding section [pp 52-56] dealt with aspects of curriculum content per se. In the context of perceptions of change, content reappears as a foil to curricular paradigm. The question begged by the title of this work is: which drives what? All attention when embarking upon our voyage of discovery in this medical school was initially focused on content, in terms of cramming six years' work into five. Certainly, staff and students interviewed expressed concern about retention of vital [core] content, as did a number of responses in the GP questionnaire. A number of staff members and GPs pointed out that at the same time, provided that the core were preserved, the use made of content in achieving educational objectives is more important than what exactly the content consists of - material is used as examples to illustrate concepts, or grist for a reasoning process, or stimulus to a systematic investigation of questions that arise.

A study of the effectiveness of medical teachers (Irby, 1978, 813) showed that of seven dimensions assessed by faculty members, postgraduates and senior students, items such as enthusiasm and organisation best differentiated between the best and the worst rated teachers, followed by group instructional skill, clinical competence and supervision, and role modelling. The worst discriminator was 'knowledge'. In a study of peer-reviewed papers on randomised clinical trials (Glynn, quoted in Iglehart, 1999, 769), an average of 509 per year were published between 1975 and 1980, rising to some 8 600 per year between 1993 and 1997. This illustrates the overwhelming amount of 'content' presented to our attention and which defies incorporation into content-based teaching. The half-life of medical knowledge has been estimated at ten years (Pickering, 1956, 115); this also attests that content-based training is a futile attempt to keep up with rapidly-outdating information.

An "ideological conflict" was recently described (Iglehart, 1999, 772) between "best practice" [which represents the current standard of care but which may be discarded in the light of further advances] and encouraging independent thinking, which implies "every[one] can do whatever". The speaker quoted anecdotal findings implying that

better service was rendered by [? more experienced] nurses acting on strict guidelines than by house-staff [under what guidance?]. A more useful comparison might have been between equally experienced staff with or without specific guidelines - nonetheless, this reflects part of the curricular tension between covering all the circumstances that the graduate doctor is likely to encounter and teaching that doctor to reason for him/herself and to be able to access information as and when needed.

My own feeling is that, in the light of the ocean of content being generated, to attempt the unequal task of keeping abreast of the wave is less likely to be successful than to inculcate the skills of accessing that content, assessing its worth and applying it to particular patients in specific settings. Surfing is a concept which resonates both with those who live and work in Durban and with those who make use of the Internet; the idea of harnessing the potentially overwhelming energy of the information wave as a means of propulsion rather than of suffocation may appeal increasingly as we further explore the deep waters of medical education.

Despite our continual anxiety about keeping control of the content of what makes a competent doctor, it appears evident that the process of change and development cannot primarily centre itself on accommodating an ever-increasing, ever-changing mass of content, but must concern itself principally with the educational paradigm within which that content which is relevant today is used as pabulum for developing intellectual abilities which will enable future doctors to take in and apply the content which is pertinent for tomorrow.

Conclusion

Answers to research questions

- What has been the dominant educational paradigm in Medicine generally, Anaesthesia specifically and the University of Natal Medical School particularly?

Judging by the literature, my own experience and comments by staff and students, it would appear that, over the past century or so, the traditional natural science / technicist paradigm of education has been predominant in medical education. Latterly, in response to developments in educational theory and the accumulating weight of calls for change from within the profession, of activation, involvement and empowerment of students and attention to the opinions and requirements of patients and society, the paradigm has moved in some schools towards the critical. As greater numbers of schools and country-wide medical education systems examine their teaching and learning practices, a postmodern scrutiny has been brought to bear, although the resulting curricula are generally critical in tone, postmodernism contributing less to the outcome than to the development process.

Kuhn's concept of paradigm shift is more akin to the tectonic shift that produces an earthquake than to a gentle slide from one educational paradigm to a position straddling two or three. For those schools which have remained firmly in the technicist tradition and are now examining in some disquiet the new world of student-centred, community-orientated learning, such a cataclysmic shift is indeed being felt.

Anaesthesia is a very science-orientated discipline and has generally found the didactic lecture to its preference philosophically - as to the discipline's epistemology - and pragmatically - as to the lecture's efficiency in broadcasting knowledge from one individual to a larger number. We gasmen have found ourselves toying with a broader conception of what might benefit students in the long run, but we remain technicist at heart. A questionnaire to Anaesthetic department members - admittedly structured around the existing course rather than forward-looking and entirely open-ended - elicited no startling new educational ideas [Appendix 4 - Q4].

Similarly, pockets within the medical school have experimented with multimedia approaches and student-centred learning:

> *Our teaching style has been changing anyway. We have concentrated on*

principles rather than detail. Computer-aided learning has changed the way we teach and made it more self-directed.

I had to learn how to learn ... I realised that principles are more important than details.

We must never limit what people can know.

The faculty as a whole is experiencing a wrench of Kuhnian proportions, as evidenced by the force of some of the comments made:

It seems to be driven by a few enthusiasts. The majority of the faculty are against change. "If it ain't broke, don't fix it."

It won't change. The information is transferred the same way whatever arrangements are made. We have the facts and we pass them on to the students.

Lectures are very efficient ... we had a good product with the old system - so why change.

Students remarked wryly on their own conservatism:

We are very conservative.

We have been spoon-fed.

- What has motivated change and what changes are suggested by the current curricular reform process at Natal's Medical School?

The influences pertinent to our own medical school are not dissimilar to those felt elsewhere in the world: more work in terms of patient load, less money for salaries and equipment, greater demands for accountability, little recognition for teaching skills, unease about the way in which the curriculum is arranged and dissatisfaction with teaching strategies. The majority of the innovations proposed to address perceived problems do come from the more developed world, it is true, but the impetus to consider these innovations arises out of our own circumstances, not out of a compulsion to ape the First World. We seek to take advantage of the work of others and to apply methodologies previously tested - granted that the testing has related to academic performance rather than long-term effects on patient care. This long-term evaluation has evidently proved extremely difficult as so many influences apart from the undergraduate curriculum affect doctors' practice.

It is accepted [with varying degrees of enthusiasm] that education at our medical school is moving towards a position which is: less teacher-centred, more student-centred; less

lecture-based, more small-group-based; less unidirectional delivery, more guided exploration; less competitive, more co-operative; less outwardly-directed, more self-directed; less stratified, more integrated; less discipline-dependent, more interdisciplinary; less teaching-hospital-based, more community-based; less content-based, more higher-cognition-centred. These changes in turn imply changes in our content, our delivery, our interaction with students, our assessment - and, it is to be hoped, our product at the end of the programme.

[Many who have been through the change process have commented on the 'political' aspects of managing change. Enlistment of support and leadership from senior faculty members and bringing in as many of the faculty body as possible have been recommended - again, if one operates only in the traditional paradigm this is a foreign and ill-fitting concept which raises uncomfortable questions about how we relate to one another and to what end. Locally, fears expressed by those within the reform process about whether a questionnaire to faculty members would rock the boat, and remarks made by those not directly involved that it was being driven by "*The government ... a few enthusiasts*" imply the need to establish a secure power base and to broaden this as far and as fast as possible.]

- Is curricular content more - or less - important than curricular paradigm in this process?

This question, sparked off by the apparently paradoxical concentration on content in our reforms, is more precisely related to changes in content and paradigm, since neither at present is static. The question as it stands can perhaps be answered only when each has reached its new position. If this were a controlled study, one aspect in turn would be kept constant while the effect of altering the other is measured. Inasmuch as this cannot be done, the question is unanswerable as is - one can only speculate, based on findings in the literature and observations made by those questioned. That this particular study does not permit us to answer the question directly does not invalidate the latter; this question underlies virtually every commentary on medical education and will continue to be of crucial importance to us and other medical education reformers.

Despite the apparent concentration on elements of content in the curriculum reform process at the UND Medical School, this has not in fact driven the process in a particular paradigmatic direction. It is true that the two elements interact: if content is to be reduced, a curricular mechanism must be found to enable the future doctors to access

what has been omitted, should they ever need it; conversely, if a curricular instrument is chosen which renders the learning of content quantitatively less efficient, the content proffered will need to be pared down. This is for medical educators a chicken-and-egg situation; as has been referred to previously, content was for many years the beginning and end of curricular concern. The natural science paradigm rendered curriculum unproblematic. Content was all - hence the century-long attempt to cram in more and more content, although accompanied by an increasing awareness that this was doomed to fail as an effective and indefinitely extensible educational method.

Recognition of the idea that there is more to curriculum than organising the most efficient way of firing content at students is itself something of a [Kuhnian] paradigm shift. Likewise the idea of using content 'merely' as fodder for intellectual rumination, digestion and growth. Likewise the concept that part of a university education may legitimately lie in development of specific and generic cognitive and practical skills and of attitudes, beliefs and values related to the graduate's position in his/her profession, community and society. My reading of the literature suggests that while coping with content is a source of anguish, writers concern themselves more with questions of paradigm - even if not explicitly identified as such. Local staff comments seemed also to relate primarily to paradigm - how their teaching practice would change; rather than to content - whether important material would be omitted. One member remarked: *"We have cut down the number of lectures we give* [by more than half] *- which was good to concentrate the mind on what was crucial."*

- To what degree do recent changes in the course content and structure of the Anaesthetics undergraduate programme relate to Faculty-wide changes?

Despite my own parochial interest, I found it difficult to include this aspect as a specific part of the research process. The GPs, having no contact with the faculty, have no insight into the relative changes, and curtailment of my probing of the faculty limited the extent to which local perceptions could be gauged. The list of lectures and the information given to students in 1987 [Appendix 5a], immediately prior to a major reform of our undergraduate programme, compared to those of this year [Appendix 5b] reveal that the number of lectures has shrunk by a third, and the information and requirements are more specific. The background to this is a decision to limit coverage of the field of anaesthesia to what is likely to be of more general use to practising doctors. Thus, rather than immerse students in the totality of anaesthesia in the hope that knowledge would adhere

and diffuse in, we specified particular areas of knowledge and skills that should be acquired. We also produced a set of notes on selected topics. Comments made by departmental members when presented with some facets of educational reform [Appendix 2b] imply movement away from a blinkered attempt to teach as much as possible of our discipline and toward broader educational aims.

Interestingly, while there is evidence of a shift in attitudes amongst staff members, students asked about their expectations prior to exposure to anaesthesia [Appendices 4b, 4c] indicated in a number of responses that they expected to be taught virtually the whole gamut of the discipline and those interviewed during the clinical anaesthesia block [Appendices 3a, 3b] were uneasy about the thought of omitting any material.

The changes made over the past few years in the Anaesthetics module have to an extent paralleled those made by other departments and anticipated the changes now being considered by the faculty as a whole. Taking a larger view, the changes still to come are bound to overshadow the tentative moves that those of us in our disciplinary enclaves have made. It was perhaps important for each of us to investigate the possibilities of breaking out of the traditional mode but, as I have suggested already, the changes now contemplated I consider to be more fundamental than moving from a predominantly traditional flavour to one with a hint of the hermeneutic. The realisation has begun to dawn that we cannot mould each generation of students into the form of our own discipline and that transferral of generic cognitive and practical skills and values should be our aim.

- To what extent may those elements of Anaesthetic teaching which are to be carried forwards into the new curriculum interact with the reform process?

This, too, is a question which proved difficult to answer. Indeed, it is a forward-looking, speculative inquiry rather than one which may be answered by retro- or intro- spection.

The process shapes its elements. The elements of Anaesthetics have been separated from one another, just as in the majority of disciplines. The elements which we have regarded as ours to retain, to modify, to teach as we see fit, may be taught, modified or rejected by members of other disciplines - and we may find ourselves asked to deal with material submitted by other disciplines from their cherished core. The intellectual privacy of being able to teach 'our' subject to 'our' students in our way without reference to what or how

they have been, and are being, taught by other disciplines; without somebody looking over our shoulders; has gone. We shall regard our fellow teachers in the same module[s] with mutual circumspection - and growing interest. We shall learn from one another. Certainly, when 'our' material is presented in small group discussions, there will be more opportunity to explore wider cognitive and philosophical issues than at present, when covering the content is our chief concern.

The interaction of a faculty-wide process and elements of individual disciplines is bound to be chiefly unidirectional; disciplines separately will have relatively little influence on the wider faculty. Anaesthetics as a relatively minor part of the undergraduate curriculum has perhaps two contributions to make to the process. One is the example of how a discipline can pare its material down to a core applicable to the education of a general practitioner. Intriguingly, the staff members interviewed personally [Appendices 2d-h] all felt that anaesthesia should be represented as a discipline:

If a subject is too widely diffused, it may make no impact with regard to learning its principles.

The new curriculum may integrate [material] *but it won't integrate subjects.*

It's not just aspects of the discipline - it's the discipline as a whole...integrated with others.

As previously mentioned, this attitude, reasons for which were not precisely articulated, may have its roots in political rather than educational reasons.

Another interaction - philosophical rather than practical - is by way of an illustrative analogy: several writers have remarked that Problem-Based Learning has not proved itself as to the long-term outcome: 'Do the patients of PBL-trained doctors do better than patients of traditionally-trained doctors?' This will be difficult to substantiate, there being so many other influences apart from the doctors' training. My own view is tempered by my experience in pain management. Purists demand that I demonstrate a measurable improvement in patient outcome: Do pain-free patients recover faster or consume fewer resources? My 'measurable outcome' is the relief of suffering. That my patients are more comfortable is my justification for changing from traditional methods and for expending resources. Similarly, in the field of medical education, whether or not long-term gains are measurable, if, as reported, students are more enthusiastic and enjoy their education and are at least as competent as those trained under the traditionalist cram-it-all-in paradigm - that will suffice for the time being. That alone may be reason to reform the medical school curriculum by changing paradigm and purging content.

Implications, Further research

The aforegoing suggests that the curriculum reform process at the University of Natal Medical School and in the Department of Anaesthetics is following a similar course to that of medical education throughout the world. There is a sense of isolation - in terms of geography and our peculiar constraints as to resources, students' school background and the health service's ability to support teaching functions - which is not supported by the literature; similar problems have been and are being faced by other institutions.

The move from a traditional didactic natural-science paradigm of teaching to a critical stance influenced by postmodernism is a world-wide phenomenon and in Medicine should be welcomed; it is long overdue. The de-emphasising of a punitive load of curricular content and its subordination to theories of learning so as to help the student become a deep, life-long learner is also a step forward. Anaesthesia is not alone in being caught in tension between maintaining its own identity as a discipline and in contributing co-operatively to an integrated educational experience. The transition period is not nearly over and the end-point for this medical school is not yet clear, although the experiences of others who have followed this route may guide, inform and warn.

Items arising from the literature or from local investigation which warrant further exploration:

- Whether the secondary school background of our students will prove to be a problem when they are faced with problem-based learning. This has been mooted as a possible stumbling block; on the other hand medical students, even with "massification" broadening the intake, tend to be the intellectual cream of school-leavers and will already have surmounted considerable difficulties to matriculate.
- The experiences of other medical school in similar circumstances should be elicited. Published experience on PBL in developing countries is sparse. Most pertinent for us would be those of the University of Transkei Medical School
- Long-term evaluation of the product of our new curriculum. Even in countries with national examinations [which have been able to substantiate the academic parity of PBL with traditional systems] the follow-up of graduates in their practice of medicine has not been well done. Anecdotal evidence in this country suggests that Transkei graduates have been among the best in the hospitals where they have been interns. The internship and subsequent "community service" years might provide an opportunity to compare doctors from differing educational systems.

- The role that strategic departmental responses to integration may play in shaping the interim process and the final product of reform. A number of writers delineate the fact that this sort of change is as much a political as an educational process; prior experience with reform initiatives locally supports the implication that diplomacy plays a vital role.

- Student roles in forming, carrying forward and evaluating the new curriculum. Both the literature and the implications of those paradigms other than the Technicist speak of the importance of involving students in the ongoing process. Our students have not been vocal during the process thus far but attempts have been made to keep them abreast of developments. Their part in evaluating the curriculum once it is up and running will be crucial.

- Whether the 'coveritis' as evidenced by students before their anaesthesia contact will be mitigated by experience of the core-content philosophy. Feedback obtained previously after their anaesthetic experience has concentrated on what they have done rather than to what extent their expectations have been met.

- Whether 'coveritis' in general subsides as the new curriculum is put into effect. Evidence elsewhere appears to be that students [and staff] do relax into the new paradigm; it would be interesting to know the extent and the time course of such changes here.

- It would be interesting and perhaps instructive to complete the study as originally intended by repeating the GP questionnaire amongst the staff and students within this medical school and to make a three-way comparison between the perceptions of those in the workplace, those responsible for producing successive generations of practitioners, and those who at present are in training to become those practitioners.

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Appendices

Appendix 1a: GP Questionnaire

Department of Anaesthetics
Faculty of Medicine
University of Natal
Private Bag 7
Congella
4013

August 1999

Dear Colleague

I am writing to you to seek the benefit of your experience as a medical practitioner in KwaZulu-Natal. This Medical Faculty is reforming its curriculum at present, aiming to produce a graduate who has the benefits of a university education *and* is at home in the real world of general medical practice. Input has been derived from country-wide research, but since we are based in this province, it seems sensible to ask the opinions of doctors such as yourself who practise here.

I have a specific research interest in curriculum development and I should like to ask you to consider, in your practice, what principles of education and what areas of medicine are or would have been of use to you. As a secondary issue I should also like your comments on what aspects of Anaesthetics you think are important to the non-specialist.

I should be very grateful if you would complete the enclosed questionnaire and return it in the envelope provided. Your responses will be kept confidential. [Forms are numbered in order to check off replies received.] *If you would like feedback* on responses received [I am approaching doctors throughout the province] please fill in your name and address and return the portion of the letter below.

May I ask you to reply by 20th August?
Many thanks for your time and your help.

T.E.Sommerville
Principal Anaesthetist
Member of Curriculum Development Task Force

If needs be, I can be contacted at   (031) 403 3223 x 2203 [office]
(031) 767 1753 [home]
Email: sommer@med.und.ac.za

I should like to be informed of the results of this survey
NAME: ....
ADDRESS:..
....
....
....

Medical Curriculum Reform Questionnaire
1999
Thank you for participating in the search for a curriculum for this country for the new millennium.

The first four statements are open-ended; please circle reply / fill in the space.

1. My medical degree was obtained in **Durban / South Africa / elsewhere**.
2. I have been in practice for .... years.
3. The duration of my medical degree course [excluding internship] was .... years.
4. A medical degree course should be **<4 / 4 / 5 / 6 / 7 / >7** years' duration.

Below are 14 statements with which you are asked to agree or disagree.
Please indicate responses with the following symbols:
A = strongly agree   B = agree   C = neutral   D = disagree   E = strongly disagree

5. The main function of a medical school should be to provide students with knowledge.   [   ]5
6. Students should have covered the whole of the medical field by the time they graduate.   [   ]6
7. What is taught at medical school is more important than how it is taught.   [   ]7
8. Students inevitably interpret knowledge in their own individual ways.   [   ]8
9. Medical knowledge should be taught without reference to society's expectations of the profession. [   ]9
10. Nowadays everything is so fluid that it is hardly worth teaching 'facts'.   [   ]10
11. Medical science - e.g. Anatomy, Pharmacology - should be taught together with clinical disciplines. [   ]11
12. A broad range of clinical / technical / practical skills is more important than pure factual knowledge. [   ]12
13. In my practice I use much more knowledge than I learned at medical school.   [   ]13
14. I was taught too much specialised information at my medical school.   [   ]14
15. Teaching medical students how to think and how to learn is more important than teaching them facts. [   ]15
16. Only faculty staff should do medical teaching - in or out of medical school.   [   ]16
17. This is the wrong time to be making changes in medical teaching.   [   ]17
18. Our high school matriculants would be able to cope with a system placing more responsibility
upon themselves for their learning.   [   ]18

In the next 7 items, on the line between each pair please mark where *your* medical school seemed to be, above the line,
and where you think the *ideal* should be, below the line.

[e.g. Teacher-   _____|_____ Student-
centred | centred]

19. Teacher-centred   _____ Student-centred   19
[Based on lecturers'   [Based on
organisation & presentation]   students' needs]

20.
21. Problem-based   _____ Information accumulating
[Revolves around problems   [Builds up knowledge   21
to be solved]   layer by layer]

22.
23. Discipline-based   _____ Integrated interdisciplinary
[Taught by discrete   [Subjects cover   23
departments]   several disciplines]

24.
25. Community-based   _____ Hospital-based   25
[Include. GPs, peripheral   [Teaching hospitals only]
hospitals, clinics]

26.
27. Compulsory programme _____ Core plus electives   27
[Set syllabus   [Basic programme
taken by everyone]   plus choices]

28.
29. Systematic teaching   _____ Opportunistic teaching   29
[Structured sequence   [Use of clinical material
in teaching clinical & diagnostic skills]   as cases are available]

30.
31. Medicine as an art   _____ Medicine as a science   31

32. / p.t.o.

Which of the following broad areas which we are thinking of including in the new curriculum would you have found useful to have been taught for *your own practice*? Please rate each between 1 [of little use] and 10 [very useful]. Leave boxes empty if aspects are not relevant to your practice.

33. Communication skills   [   ]33
34. Computer skills   [   ]34
35. Clinical skills   [   ]35
36. Nutrition, Malnutrition, Related disease states   [   ]36
37. Growth and Development   [   ]37
38. Infection, Inflammation, Immunology   [   ]38
39. Reproductive health including STDs, Abortion   [   ]39
40. Infertility, Pregnancy, Menstrual disorders   [   ]40
41. Trauma & pain management   [   ]41
42. Cardiorespiratory disorders incl. HT, CCF, MI, CPR, Dyspnoea.   [   ]42
43. Childhood infections & Infestations, Immunisation   [   ]43
44. Digestion: Anatomy, Physiology, Pathology   [   ]44
45. Urinary tract - function, pathology   [   ]45
46. CNS - including disabilities   [   ]46
47. Musculoskeletal including sports medicine   [   ]47
48. Spine & peripheral nerves   [   ]48
49. Endocrine disorders   [   ]49
50. Cellular dysfunction - malignancy, auto-immune diseases   [   ]50
51. Abdominal complaints - medical & surgical; pre & postop management   [   ]51
52. Ear   [   ]52
53. Eye   [   ]53
54. Skin problems   [   ]54
55. Headache, Loss of consciousness, Psychosis & Dementia   [   ]55
56. Jaundice   [   ]56
57. Diseases of lifestyle   [   ]57
58. Occupational & Environmental health   [   ]58
59. Practice management   [   ] 59
60. Therapeutics   [   ] 60
61. Community Health   [   ] 61
62. Medicine   [   ] 62
63. Surgery   [   ] 63
64. Obstetrics & Gynaecology   [   ] 64
65. Paediatrics   [   ] 65
66. Psychiatry   [   ]66
67. Family Medicine   [   ]67
Other areas ....

....
....
....
....

Please expand on any of your answers if necessary. ....
....
....
....
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....

Any further comments / suggestions on medical education? ....
....
....
....
....
....

Many thanks.   Please see separate sheet for Anaesthesia questions.

Anaesthesia - As relevant to *general medical practice*.
Please estimate your current involvement in anaesthetics as a percentage of your practice:

< 10 %;   11-30 %;   31-50%;   51-70 %;   > 70 %.

Please rate each section below according to this key:
A = must be covered; B = should be covered; C = could be included; D = could be left out; E = should be left out

Preparation for anaesthesia and surgery   [   ]
History, examination; Directed investigation
Informed consent
Ethics [e.g. Religious, other convictions against blood products; Health care workers' convictions;
        Constraints on best practice; Emergencies; Minors]

Care of the unconscious patient   [   ]
Causes; Assessment
Maintenance of Airway; Breathing; Circulation
Monitoring

Pain   [   ]
Definition; Physiology; Pathophysiology
Measurement
Attitudes toward patients in pain

Acute pain - [Surgical, Traumatic, Obstetric]   [   ]
        Drugs, side-effects
        Patient-controlled vs carer-controlled; Balanced analgesia

Chronic pain - [Degenerative & Post-traumatic; Malignant]   [   ]
        Methodology compared to acute pain
        Drugs - primary, secondary analgesics
        Destructive procedures
        Multidisciplinary team approach

Intravenous fluids   [   ]
Physiology of fluid balance; Pathophysiology of trauma, dehydration, water retention
IVF types and rationale for use; Risks; Crystalloids; Colloids; Blood products
Siting an IV line; CVP monitoring; Arterial line; Pulmonary artery flotation catheter

Intensive Care   [   ]
Definition; Purpose; Staffing and equipment
Ethics [Rationing of care; Decision to treat / not to treat / to withdraw treatment Involvement of patient, family, staff, society]

Respiratory support   [   ]
Basic respiratory physiology, anatomy; Respiratory failure - Clinical features; Arterial blood gases
Supportive measures; Complications; Weaning from respiratory support

Cardiovascular support   [   ]
Basic cardiovascular physiology, anatomy; Assessment of cardiovascular status
Cardiac failure - Causes, clinical features; Shock - Types, clinical features
Supportive measures - Fluids; Drugs - doses, effects, side-effects; Mechanical assist devices - problems, complications; Weaning from support

CardioPulmonary Resuscitation   [   ]
Theory [Physiology of circulation & Gas exchange; ECG - normal and abnormal; Sternal compression vs Thoracic pump mechanism]
Practice - Manikin
Drugs, IV fluids, Defibrillator
Ethics - When to start; When to stop; Dealing with other patients, staff, relatives

Death, Bereavement   [   ]
Kübler-Ross stages
Empathy with patient, staff, relatives; Encouraging talking out; Interaction with religious advisers

Topics we should include ....
....
....
....

Should we in fact attempt to teach our undergraduates to give anaesthetics?
        Please ring response: **Agree strongly / Agree / Neutral / Disagree / Disagree strongly**

Many thanks for your time and effort.   I trust this will give us a better idea of needs in our province.   TES

No.\Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	c
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173	e	20	7	6/7	a	a	d	b	d	e	b	d	b	b	b	d	d	d	10	66	27	78	20	77	21	76	1	84	62	29	45	45	10	10	10	10	10	10	10	8	8	10	10	7	9	8	9	8	7	7	8	10	10	10	10	8	10	10	10	10	10	10	10	10	10	10	10	
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4	sa	23	6	6	a	a	c	e	b	e	e	c	d	d	b	c	a	e	48	49	41	72	79	46	76	87	79	77	21	21	52	56	3	8	10	3	4	8	3	6	10	9	7	5	5	4	6	7	7	7	8	8	8	8	8	8	6	5	5	8	3	9	9	9	9	5	9	/
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215	d				b	c	d	a	e	e	b	a	d	b	b	a	e	a	70	38	83	15	78	26	34	31	80	38	22	42	51	51	8	5	10	8	8	8	8	6	6	8	8	6	6	6	5	6	6	5	8	6	8	6	6	7	6	8	6	8	6	8	6	8	6	8	/
229	d	4	6		a	a	b	b	d	e	b	b	a	a	d	d			17	48													10	10	10	10	10	10	10	10	10	1	1	10	10	10	10	10	10	10	10	10	10	1	1	10	10	10	10	10	10	10	10	10	/
95	sa	39	6	5	a	d	d	d	a	e	b	a	d	c	a	a	d	d	15	52	65	17	40	84	85	39			82	33	15	60	7	2	8	2	3	4	2	4	5	8	5	4	3	5	3	2	2	4	6	2	2	3	3	1	1	3	3	4	3	8	7	7	7	3	3	/
66	sa	40	6		d		d	b	d	d	b	d?	b	b	d?	d	d	d?	47	47	31	59	19	69	15	67	19	70	79	30	51	51	10		10	8	7	8	7	7	7	7	8	7	7	7	6	6	6	6	7	7	7	7	7	6	6	8	5	5	8	5	8	7	5	9	5	7	
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109	e	10	6		b	b	b	b	c	e	d	b	d	d	c	c	c	c	49	60	31	69	25	65	52	52	5	58	67	36	89	47	10	5	5	10	10	5	10	10	5	10	10	5	5	5	5	5	5	5	10	5	5	10	10	5	5	10	10	5	5	10	10	10	10	1	10	/
17		17	6		b	b	b	b	d	b	a	b	a	b	d	d	b																10	10	10	10		10	10	10	10	10	10	10	10	10	5	5	5	10	10	6	10	10	10	10	6	10	10	10	10	10	10	10	10	1	10	/
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124	e	13	5	5	d	d	e	b	d	d	a	a	b	a	c	e	e	b	14	71	87	27	88	57	77	36	89	13	54	54	47	73	10		10	9	6	9	6	8	7	9	6	7	6	5	6	5	6	8	9	5	6	9	7	8	10	8	8	8	8	7				
13	sa	36	6	6	b	b	c	c	b	d	d	b	b	b	a	b	d	d	d														10	10	10	7	6	8	8	9	8	8	6	10	8	8	6	8	6	10	8	8	8	8	6	8	6	8	8	8	8	6	6	
226	e	13	5		b	b	e	a	e	e	a	a	a	a	c	e	e	a	61	52	84	16	78	16	7	32	96	1	6	7	90	90	10	10	10	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	/
175	sa	16	6	6	b	a	d	b	e	e	a	a	a	b	e	e	d		20	49	23	71	24	89	16	51	22	24	75	66	83	65	10	10	10	7	7	7	7	8	7	10	10	5	6	7	7	8	8	6	9	10	10	10	10	6	10	6	7	9	6	9	7	7	10	9	10	/
188	d	13	6	6	b	b	d	b	e	d	b	b	b	c	c	d	d	c	18	49	24	52	17	49	14	42	20	42	75	60	51	51	8	8	10	6	6	7	5	5	10	5	6	6	4	10	7	10	7	7	7	7	6	6	10	6	8	6	5	7	8	7	8	7	6		/
221	e	18	6	6	b	d	d	d	b	e	d	b	b	d	a	c	e	a	27	43	93	35	7	57	59	5			5	48	9	5	9	7	7	7	9	8	8	9	9	8	5	6	5	5	8	7	9	8	5	6	8	9	7	7	4	8	9	7	8					
284	e	2	6	5	b	c	b	b	c	a	a	a	b	d	c	d	d	d	19	80	94	5		5	97	38		7	94			90	10	10	10	6	7	7	7	9	9	5	7	6	2	2	4	9	7	6	3	3	4	7	4	1	5	6	6	10	7	2	5	5	5	6	3	5	
70	sa	2	6	6	a	a	e	b	e	e	c	a	a	a	b	d	c	d	28	54	28	69	52	92	0	33	4	19	48	48	87	87	10		10	9	5	9	5	9	10	10	4	2	8	9	1	8	7	4	10	7	5	8	10	4	10	3	1	6	9	6	6	8	6	9	/
248	sa	29	6		b	b	c	b	a	d	b	d	b	b	d	d	d	b	62	81	53	64	78	65	60	72	83	87	51	35	55	33	5	7	8	4	5	5	5	6	5	7	7	7	7	6	6	7	7	8	7	7	8	5	5	5	6	7	6	5	6	6	6	6	6	6	
59		13	6		a	b	c	b	c	d	c	b	d	b	d	b	b		19	44	37	51	6	49	11	29	8	35	86	58	90	71	7	9	9	6	4	5	5	10	8	6	5	6	7	6	6	6	7	7	6	6	6	4	6	5	4	4	5	5	10	10	10	10	8	7	
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290	sa	22	5	6	b	c	d	d	d	b	b	a	b	a	c	a	d	d	27	77	22	74	26	77	22	74	2	66	78	34	79	24	10	10	-10	8	6	8	8	6	8	6	5	5	6	8	6	6	5	6	8	6	8	10	6	5	8	8	6	5	8	6	6	8	7	8	/
46	sa	33	6		b	c	c	d	d	b	c	b	d	b	b	d	a		9	47	91	7	5	22	13	44	10	11	88	49	91	91	6	7	8	7	5	6	3	7	7	8	10	6	6	7	8	7	7	7	5	7	7	8	7	6	4	4	7	8	8	4	7	10	7	7	
114	e	12	6	6	b	b	c		d	d	d	c	b	c	c	d	c	d	47		52		23		77		52		76		55		8		7	6	5	9	8	8	7	7	7	7	6	5	5	5	5	5	10	6	7	7	7	7	5	5	5	8	5	8	8	7	7	6	9	
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61	sa	49	6	6	b	a	a	a	d	e	b	a	a	e	d	d	c	a	13	69	81	96	29	15	20	77	8	9	92	61	17	10	8	10	10	10	7	8	7	7	8	10	10	7	8	10	10	10	10	10	10	10	10	8	10	10	10	10	10	10	10	10	10	10	10	10	/
12	sa	4	6	5	c	a	e	c	d	e	a	b	c	c	c	d	d	b	18	36	13	37	7	14	9	40	0	8	51	51	94	51	6		5	7	7	7	7	7	7	7	7	7		7	7	6	8	7	7	7	7	7	5				7	9	9	9	9	9	/
20	e	31	6		b	b	d	b	d	d	b	b	b	d	b	d	d	b	35	84	84	30	23	69	77	39	24	61	77	18	14	66	8	9	8	7	8	9	9	8	9	9	9	7	8	7	8	8	8	9	9	9	8	8	8	7	7	6	7	8	8	9	9	8	8	
266	e	34	6	5	a	d	b	b	d	e	a	a	a	b	a	c	d	c															8	8	10	7	2	6	6	6	7	6	6	4	5	6	6	5	4	6	6	6	6	8	6	5	4	4	4	3	7	5	6	6	6	4	/
122	sa	13	6		a	a			d	d	a	c	d	c		c					83	19											10	10	10	10	10	10	10	10	10	9	9	9	10		10	10	10	10	10	10	10	10	10	6	10		5	5	5	7	3	9	/
263	d	19	6		b	d	d	c	e	b	b	c	d	d	b	c	c		6	30	34	63	14	35	90	38	30	56	52	46	15	46	8	8	4	2	5	10	5	10	10	10	2	3	3	8	6	7	4	10	8	10	10	6	10	6	10					
244	e	21	6	6	a	a	c	a	e	e	a	a	a	d	a	c	e	a	19		81		19		81		19		81		93		10	10	10	9	9	10	10	10	10	10	10	10	10	10	10	10	5	10	10	10	5	10	10	10	7	10	10	10	10	10	/
81	sa	10	6	5	b	b	d	b	d	c	b	b	e	b	a	d	e	d	13	68	17	87	13	63	24	71	0	65	64	32	74	42	10	8	6																							7	8						
1	e	23	5		d	b	d	e	e	c	a	a	b	a	a	a	e	c	1	44	5	6	22	45	4	4	94	2	97	96	98	3	10	10	5	5	5	6	6	5	10	6	4	5	5	5	2			10	10		10	6	7	8	6	4	5	7	7	6	7	/
102	sa	10	6	6	d	d	d	b	d	d	b	c	d	b	b	a	d	b	28	49	55	48	13	76	15	47	14	53	85	46	87	47	6	4	10	4	7	7	8	8	7	6	7	4	4	6	7	4	4	6	7	4	8	8	8	8	8	8	8	8	8	8	7	8	
291	sa	15	6		a	a	a	d	b	e	b	c	d	b	b	a	d	b	67	49	39	17	66	31	12	52	18	56	43	9	73	74	7	6	10	6	6	7	5	8	8	7	7	7	5	6	6	6	6	6	7	7	8	7	7	7	8	8	7	8	8	8	8	7	8	
257	e	12	5	5	b	b	c	b	c	d	c	b	c	c	d	c	d	c	15	33	52	88	15	35	84	84	16	16	84	65	78	57																																			
236	d	19	7	6	b	c	d	b	e	d	b	b	b	a	e	e	d		25	50	21	67	17	53	23	50	22	65	50	50	52	52	10	10	10	10	7	9	9	7	10	8	10	8	9	10	10	10	6	7	10	8	10	10	7	6	10	6	10	10	9	10	7	10	7	8	/
271	d	10	6	6	b	c	d	b	e	e	a	a	b	b	a	d	d	d	91	85	88	96	47	19	11	8	93	96	11	9	93	77	10	10	10	6	5	10	10	10	10	10	10	10	10	10	10	5	10	10	10	10	1	10	10	10	10	10	6	10	5	5	10	/
130	d				a	b	b	e	c	b	c	d	d	b	b	e	c		13	24	44	52	6	10	4	14	2	3	55	55	71	71																																		
189	d	20	7		b	a	e	c	d	d	a	a	b	a	e	e	b		14	53	61	7	6	71	23	50	7	72	93	92	86	52	10	8	10	6	10	10	10	10	8	6	8	10	8	8	10	10	10	6	8	6	8	8	8	8	10	8	6	8	
42	e	17	5	5	b	d	d	c	d	d	b	c	d	b	b	d	d	b	29	50	28	73	27	73	30	47	72	71	65	61	79	25	8	5	10	2	2	6	7	7	8	7	6	7	6	5	5	4	2	4	8	4	4	2	1	4	2	3	5	6	7	8	9	9	7	5	/
272	sa	1	6	6	a	a	c	c	b	d	e	a	d	c	b	b	d	d	7	50	16	51	12	81	12	32	12	22	24	25	76	79	50																																	

Appendix 1c   Medical Curriculum Reform Questionnaire 1999   Summary of responses

Number of responses: **56**
1.   Degree obtained in Durban: **12**   South Africa: **25**   Elsewhere: **16**

2.   Years in practice: Mean **16.2**   Range **1 - 49**

3.   Duration of own medical degree course: Mean **5.9** years
4.   Medical degree course should be: Mean **5.6** years

Rating key: A = strongly agree B = agree C = neutral D = disagree E = strongly disagree

	A+B n	D+E n
5. The main function of a medical school should be to provide students with knowledge.	51	4
6. Students should have covered the whole of the medical field by the time they graduate.	41	9
7. What is taught at medical school is more important than how it is taught.	7	36
8. Students inevitably interpret knowledge in their own individual ways.	34	9
9. Medical knowledge should be taught without reference to society's expectations.	9	39
10. Nowadays everything is so fluid that it is hardly worth teaching 'facts'.	2	49
11. Medical science should be taught together with clinical disciplines.	42	11
12. A broad range of skills is more important than pure factual knowledge.	42	6
13. In my practice I use much more knowledge than I learned at medical school.	38	14
14. I was taught too much specialised information at my medical school.	29	19
15. Teaching medical students how to think and learn is more important than teaching facts.	41	7
16. Only faculty staff should do medical teaching - in or out of medical school.	9	38
17. This is the wrong time to be making changes in medical teaching.	4	43
18. High school matriculants would be able to cope with more responsibility for their learning.	25	19

Own medical school above the line; ideal below the line.

Mean ± Standard Deviation

19. Teacher-centred $\underline{\quad\quad 27.5 \pm 20.8 \quad\quad}$ Student-centred
20. 55.0 ± 16.3

21. Information $\underline{\quad\quad 48.0 \pm 28.7 \quad\quad}$ Problem-based
22.   accumulating 50.7 ± 25.8

23. Discipline-based $\underline{\quad 30.6 \pm 23.9 \quad\quad}$ Integrated
24. 54.2 ± 23.5 interdisciplinary

25. Hospital-based $\underline{\quad 37.1 \pm 29.7 \quad\quad}$ Community-based
26. 45.9 ± 22.0

27. Compulsory $\underline{\quad 31.8 \pm 31.3 \quad\quad}$ Core plus electives
28.   programme 47.3 ± 27.1

29. Opportunistic $\underline{\quad\quad 62.3 \pm 25.4 \quad}$ Systematic teaching
30.   teaching 48.7 ± 22.5

Mean [19, 21, 23, 25, 27, 29]: $\underline{39.4 \pm 29.1}$
Mean [20, 22, 24, 26, 28, 30]: 50.5 ± 23.0

31. Medicine as an art $\underline{\quad\quad 61.2 \pm 28.3 \quad}$ Med. as a science
32. 54.0 ± 21.9

Broad areas to be included in the new curriculum useful for own practice   Rated between 1 and 10.

	Mean
33. Communication skills	8.4
34. Computer skills	7.7
35. Clinical skills	9.0
36. Nutrition, Malnutrition, Related disease states	7.0
37. Growth and Development	6.3
38. Infection, Inflammation, Immunology	7.7
39. Reproductive health including STDs, Abortion	7.4
40. Infertility, Pregnancy, Menstrual disorders	7.6
41. Trauma & pain management	8.0
42. Cardiorespiratory disorders incl. HT, CCF, MI, CPR, Dyspnoea.	8.5
43. Childhood infections & Infestations, Immunisation	7.9
44. Digestion: Anatomy, Physiology, Pathology	6.2
45. Urinary tract - function, pathology	6.5
46. CNS - including disabilities	6.6
47. Musculoskeletal including sports medicine	7.2
48. Spine & peripheral nerves	6.7
49. Endocrine disorders	6.4
50. Cellular dysfunction - malignancy, auto-immune diseases	6.0
51. Abdominal complaints - medical & surgical; pre & postop management	8.0
52. Ear	7.7
53. Eye	7.4
54. Skin problems	8.0
55. Headache, Loss of consciousness, Psychosis & Dementia	7.2
56. Jaundice	6.1
57. Diseases of lifestyle	7.3
58. Occupational & Environmental health	6.5
59. Practice management	7.1
60. Therapeutics	7.7
61. Community Health	7.1
62. Medicine	8.3
63. Surgery	7.4
64. Obstetrics & Gynaecology	7.9
65. Paediatrics	8.4
66. Psychiatry	6.7
67. Family Medicine	8.0

Overall mean this section   **7.4**

Questions 19 - 32

19 20	Teacher-centred	< 0.001
21 22	Info.Accumulating	0.667
23 24	Discipline-based	< 0.001
25 26	Hospital-based	0.085
27 28	Compulsory Curric.	0.008
29 30	Opportunistic	< 0.001
31 32	Medicine as an art	0.149

Student-centred
Problem-based
Interdisciplinary
Community-based
Core + Electives
Systematic
Medicine as a science

■ Own training
▤ Ideal

0   50   100
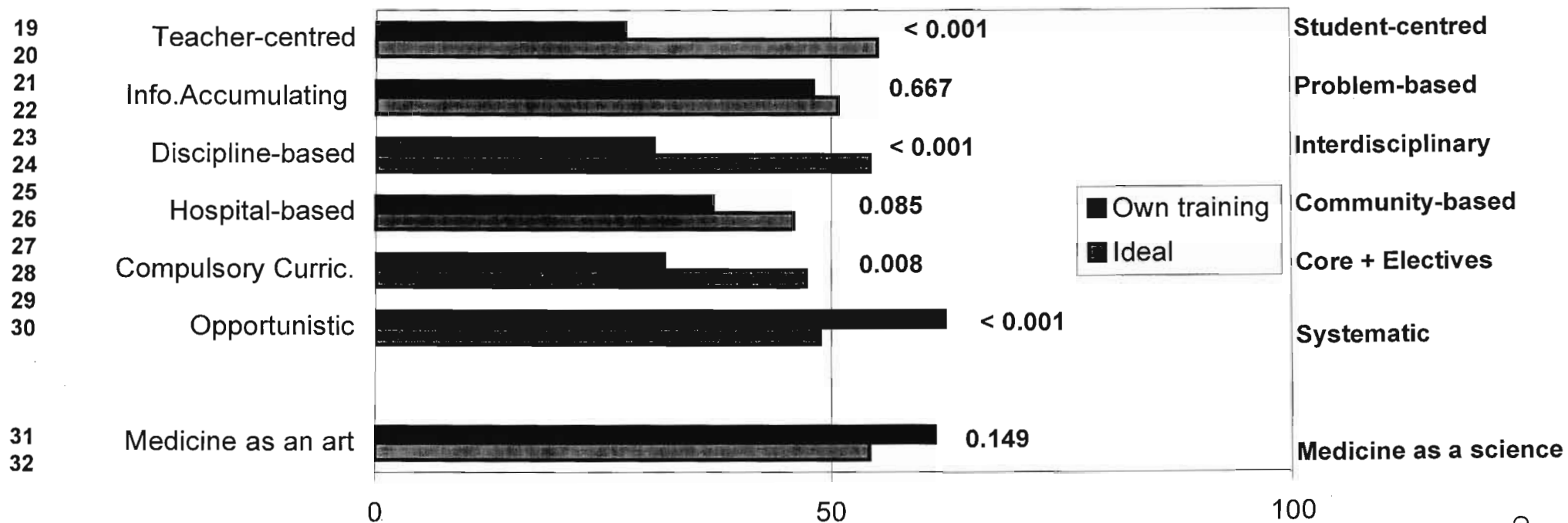
Graphical depiction of mean values on visual analogue questions 19 to 32.
Figures opposite each pair are *P* values for Student's *t* test on comparisons between "Own training" and "Ideal".

Appendix 1e   GP Questionnaire 1999   Comments

Respondent
number
↓

48   Other areas: *Cultural attitudes towards medicine in general.*
        33[Communication skills], 34[Computer skills] absolutely essential
        Present system is good, but there is room for improvement and fine tuning. There is no
        place for drastic changes.

71   *University of Rhodesia/Zimbabwe 35-67 was covered. Forensic Medicine is a field I have*
        had to teach myself as District Surgeon.
        I was a Ministry of Health Cadet. Worked vacations at rural Hospitals and we had Family
        Medicine GP attachment and community Medicine in rural areas + Appropriate Technology
        ie Blair Research institute Ch.[?] I feel my training was ideally suited to being a general
        rural specialist. This included a three year rotation I did in Ladysmith provincial Hospital
        and six months in radiology at Cape Town. I strongly feel 10 years required for this
        training but the doctor should be fully utilised as head of team in rural area.

4   *It should be seen to that medical doctors in the broader sense are not to be marginalised*
        to a "community servant". The profession should be nursed so that the doctor emerging is
        a gentleman with high esteem in the society - also as far as remuneration is concerned.

153   Other areas: *Orthopaedics*

270   *Emergency medicine*

18   *Way to many theoretical fads[?], and to little practical approach. Much more of business*
        management to be included.

215   *Education on   - Social values*
                        - Interpersonal relations
                        - Time management
                        - Finance management

229   *Computer & practice management skills should be included in the undergraduate medical*
        course.

95   *Emergency procedures e.g.   1 How to pass an intratracheal tube*
                                     2 Tracheostomy
                                     3 Thoracocentesis etc
                                     4 Cardiac / v. Emergencies

109   Other areas: *HIV - AIDS*

17   *To many unnecesary facts are being taught and that what they are goung to use in private*
        practice are overseen. Anaesthetics is but one example.

255   *Specific modules on <u>chronic</u> disease management   - Diabetes*
                                                                 - HPT
                                                                 - Chronic Renal Failure etc.
        Education should be problem based
        Students should be taught principles so that they can use knowledge to innovate[?]
        depending on circumstances.

192   Other areas: "Alternative Medicine"
Students need to know <u>about</u> other approaches to healing medicine - Traditional /
Chiropractic / Holistic / etc which their patients will be (ever increasingly) turning to

124   Detailed learning about specific problems should be replaced by a more generalised view
of what 'the public' suffer from most of the time.
Generalists rather than specialists should come out of medical school. Graduates should
come out humble and not arrogant. They should realise their position as "apprentices"
when they come out of school. Their careers are then wide open.

226   CURRICULUM SHOULD BE SET <u>WITHOUT</u> POLITICAL INTERFERENCE.

175   Majority of teaching was done by specialists or the few generalists teaching have not
been in practice for such a long time, that they became totally philosophical - needs input
from practicing GP's etc. - Should never be centralised

188   Other areas: Time management
                      Financial management
                      Personal interpersonal relationships
New & modern technological advances should not be foregone in order to rectify
imbalances toward primary health care. A healthy balance must be maintained as patient
population is dynamic in terms of their pathology

70   Other areas: OBESITY - treatment of it and its complications
                      Adequate <u>practical</u> ANXIETY MANAGEMENT for patients.
I am a rural doctor with limited resourse (drugs etc and experienced advise). Every single
thing said at Med School is vital today to cover the vast scope of different medical
specialities. If you reduce the no. of years spent at medical school, there must be
adequate institutions to make up for the experience (practically) gained in 6th year.

57   Students must get involved from 3rd year with presentations at clinical meetings. Also
related physiology should be included in the clinical discussions

290   Value systems & values that inform behaviour are essential for a life's framework
Interpersonal relationships and synergy. that can be released by appropriate human
relationships. Medical education ought to be more integrated and perhaps students ought
to be allocated tutors with a broad vision and a personal interest in their development. Pie
in the sky? These tutors need not necessarily be within the academic fraternity but from
the doctors in the community - they would be a good counterfoil to ivory towerism.

26   More reform in OBE teaching before this [matriculants coping with more responsibility
for own learning] is possible

61   As an older practitioner all of above remain extremely important. CME essential

12   Most universities are known to be good in teaching some subjects and less at others. It
may be usefull to see what those departments are doing / not doing.

266   Basically "medicine" as it was taught was adequate - <u>but</u> the manner of differentiating
between "basic sciences" and clinical teaching is too divorced - my suggestion - which
might be impracticable - is too teach by systems and diseases incorporating anatomy
physiology pathology therapeutics and clinical manifestations (ward rounds) as one entity
at the same time - thus eliminating pre-clinical years per se - one would appreciate the

disease entity far more than as with present isolated teaching methods.

263   *Require assistance with the newer disciplines due to nonexposure to lectures and practicals on these issues.*

244   *Time management. Importance of hobbies. Sports medicine*

1   *Computer skills and practice management are non existent in medical schools. Mathematics should not be a requirement for entrance to medical school.*

102   *Rural medicine constituted[?] a 2 week block in 5th year. Very little exposure*

236   Include: *Triage*
            Life support
            Health economics
    Q2   *Full time hosp practice 1980 -6/1989.*
            Part time practice / Lecturer 7/1989 - Date

271   Include: *Personal finance and personal time management*

I have found that most mothers take their children to the paediatricians from the outset, instead of having a GP see the child first, therefore I find that unless the attitudes change then this subject being offered in more detail shall be more appreciated by a student intending to become a GP in a surrounding close to specialist paed. practices. Newly qualified doctors must first work in a hospital environment for at least 12 months before being allowed to enter private practice in order to practise his/her GP skills in preparation for GP practice - relevant exposure is necessary - more practical everyday GP problems encountered can be more confidently managed!

42   Include: *Psychology*
    To be a successful practitioner application of clinical skill cannot be over-emphasized

Appendix 1f GP Questionnaire Raw data - Anaesthesia

No.\Q	An.%	Pre	Uncon	Pain	Acute	Chroni	IVF	ICU	Resp	CVS	CP	Death	Dope	comment
A	<10	b	a	c	a	d	b	d	e	e	a	e	a	
B		a	a	b			c	d	e	b	a	b		
D														
250	<10	a	a	a	a	a	a	a	a	a	a	b	b	
173	<10	a	b	a	b	a	a	c	c	c	a	a	a	
48	<10	b	a	a	a	b	b	a	a	a	a	a	a	
71	<10	b	b	b	b	b	b	b	b	b	b	b	e	/
4	11-3	a	a	b	b	c	b	b	a	a	a	a	a	
153	<10	c	b	b	b	b	b	c	c	c	b	b	c	
270	<10	a	a	a	a	a	a	a	a	a	a	a	b	
18	<10	b	a	d	b	c	a	a	a	a	a	a+	b	
277	11-3	b	a	a	a	a	a	b	a	a	a	b	a	
165	31-5	b	a	d	a	b	b	c	b	b	a	d	d	
160	11-3	b	a	b	c	c	a	a	b	b	b	c	a	
194	<10	a	a	a	a	a	a	a	a	a	a	a	a	
148	<10	a	a	a	a	a	a	a	a	a	a	a	a	/
215		a	a	b	b	b	c	c	c	c	b	b		
229		a	a	a	a	a	a	a	a	a	a	b	c	
95	<10	b	a	b	a	b	a	b	a	a	a	b	b	
66	<10	a	a	a									b	
115	<10	a	a	b	a	b	a	b	a	a	a	b	a	
109		c	a	a	a	a	a	e	b	a	a	d	c	
17		a	a	a	a	a	a	a	a	a	a	a	a	
269	<10	a	a	b	b	a	b	b	a	a	a	b	b	
255	<10	a	a	a	a	a	a	b	c	a	a	a	a	/
192	<10	a	a	a	b	b	b	c	c	b	a	a	c	
124		a	a	c	c	c	a	d	c	c	b	a	a	/
13	51-7	b	a	b	a	b	a	a	a	a	a	c	a	
226	<10	a	a	a	a	a	a	a	a	a	a	a	e	
175	<10	a	a	a	a	a	a	c	a	a	a+	a	a	
188	<10	a	a	a	a	a	a	b	b	b	a	a	a	
221	<10	a	a	b	b	c	a	c	b	b	b	c	b	
284	<10	a	a	a	a	a	a	a	a	a	a	c	c	
70	11-3	a	a	b	a	a	a	c	a	a	a	c	a	/
248	<10	a	b	b	b	b	b	c	b	a	a	b	a	
59	<10	a	a	b	b	b	a	b	a	b	a	b	c	
57	<10	a	a	b	b	b	a	c	c	b	b	a	b	
290	11-3	b	a	a	b	b	a	d	b	a	a	b	b	/
46	11-3	b	a	c	b	b	a	b	a	a	b	c	a	
114	31-5	b	b	b	b	c	c	e	b	b	b	c		
120	<10	b	a	b	a	b	a	a	b	a	a	a	a	
26	>70	a	a	b	a	a	a	b	a	a	a++	a	c	/
61	<10	a	a	a	a	a	a	a	a	a	a	a	a	
12	31-5	a	a	a	a	a	a	a	a	a	a	a	a	/
20	<10		a	a	b	b	a	b	b	a	a	a	b	
266	<10	b	a	c	b	b	b	d	c	a	b	d	d	
122	<10	a	a	a	a	a	a	a	a	a	a	a	a	
263	<10	a	a	b	b	c	b	c	c	b	a	b	c	
244		d	a	a	a	a	a	d	d	a	a	a	a	/
81	<10	a	a	c	b	b	a	c	b	b	a	c	c	/
1	>70	a	a	c	d	d	a	b	b	b	a	d	b	/
102	<10	a	a	a	a	a	c	c	c	c	a	c	a	
291	<10	a	a	a	a	c	a	a	a	a	a	c	b	
257	<10	b	a	b	a	b	a	a	a	a	a	b	c	
236		a	a	a	a	a	a	a	a	a	a	a	a	/
271							/							
130	<10	b	a	a	b	a	a	c	b	a	a	b	a	
189	<10	a	a	b	a	b	b	c	b	a	a	a	b	
42	<10	a	a	b	a	c	a	b	a	a	a	b	b	
272	>70	a	a	c	a	c	a	a	b	b	a	c	c	/

—— Data discarded - see text

Appendix 1g   Questionnaire responses
        Anaesthesia - As relevant to general medical practice.

Number of responses: **55**

Current involvement in anaesthetics as a percentage of practice:

< 10 %: **35**   11-30 %: **6**   31-50 %: **3**   51-70 %: **1**   > 70 %: **3**

Rating key:
 A = must be covered; B = should be covered; C = could be included; D = could be left out; E = should be left out

	A	B	C	blank	D	E	A+B	D+E
	n	n	n	n	n	n	n	n
Care of the unconscious patient	50	5	0	0	0	0	**55**	**0**
CardioPulmonary Resuscitation	44	10	0	1	0	0	**54**	**0**
Intravenous fluids	40	11	3	1	0	0	**51**	**0**
Preparation for anaesthesia	36	15	2	1	1	0	**51**	**1**
Acute pain	31	20	2	1	1	0	**51**	**1**
Cardiovascular support	35	14	5	1	0	0	**49**	**0**
Pain	26	21	6	0	2	0	**47**	**2**
Respiratory support	27	16	10	1	1	0	**43**	**1**
Chronic pain	23	20	10	1	1	0	**43**	**1**
Death, Bereavement	23	16	11	1	4	0	**39**	**4**
Intensive Care	19	14	15	1	4	2	**33**	**6**

Should we teach undergraduates to give anaesthetics?

Response key: Agree strongly Agree Neutral Blank Disagree Disagree strongly

                        24   **14**   **11**   **2**   **2**   **2**

71   *Skill is knowing areas of emphasis, method of teaching and concentrating on common, more difficult areas. Must be practical. I did six months full time Hospital Anaesthetics and >30% for one year. 5-10% Rest. Teach Principles only. ie we had 2 week course - 1 week practical / one week theory.*

255   *Conscious Sedation*
        REGIONAL ANAESTHESIA NB
        Ketamine use for procedures

124   *Widely used anaesthetics in rural practice e.g. Ketamine, spinal and regional anaesthetics. Many doctors are both surgeon and anaesthetist in our settings.*

70   *[Agree strongly teach undergraduates to give anaesthetics] BECAUSE YOU MUST KNOW TO DO A GENERAL ANAESTHETIC - IT CAN BE LIFESAVING - YOU MIGHT END UP A RURAL DOCTOR!!*

290   Topics we should include:
             Ability to   *- intubate / secure airway*
                              - provide an intravenous line
                              - deal with an acute life threatening situat'n
        [give anaesthetics] →   *wonderful to have this in ones armamentarium.*

26   *Airway management, Life Support (advanced); Death & Bereavement & Pain Management more NB than Doping for undergrad!!*

12   *Note: the university where I studied, equipped me to give a confident GA after graduation but I have noted that most other graduates are not able to do so. I am very gratefull to be able to give a G.A. right from the start. Theory with hands on experience are very important. (UOVS)*

244   *You have covered everything pretty well.*

81   Include: *How to perform a spinal anaesthetic*
                     Management of the difficult airway
                     Management of "high spinal"
        I never really learnt how to give an anaesthetic at medical school. I only learnt this as a MO at a Rural Hospital much later.

1   Include: *Local, Regional esp Spinal / Epidural anaesthesia.*

236   *Above list satisfactory Timing should be ± 5 yr onwards*

272   Include: *Basic Life Support - Prehospital care*

Appendix 2a   A series of questions posed to me by a colleague after a meeting.

Respondent recently involved in the reform process; actively contributing at general and module design level; asked by department of origin to keep them updated; aware of some resistance within department.

Brief notes were made at the time and transcribed and rearranged afterwards.

Why a new system?

What is wrong with the old system [which produced me and my colleagues]?

Does it [the proposed new system] work?

Are there controlled trials to substantiate its use?

What has happened to McMaster and Newcastle[¶] ?

Are the outcomes of the new system specified?

Reasons for including basic sciences.

What will become of clinical teaching?

     Seeing patients

        Taking a history

        Eliciting clinical signs

     Accompanying a practitioner

        Learning by apprenticeship

Our clinical material is our best resource

In our department we have followed a sequence over the three years of student contact:

     IV Clinical aspects: History, clinical signs

     V   The broader picture of various conditions

     VI Synthesis: Formatting a management plan

[¶] Two prominent examples of integrated, learner-centred, problem-based curricula.

Will clinical skills be integrated?

Will clinical outcomes be specified for each year?

> *e.g.*   *I*   *History taking*
>
>   *II* *Examination of body systems*
>
>   *III Differential diagnosis*
>
>   *IV Investigation and Management [+ rationale for management]*
>
>   *V Pulling systems together*

Are the blocks making up the degree programme appropriately placed?

Is the positioning of the blocks haphazard?

How will our department be involved? [Major concern]

Concern about quality if non-faculty [provincial or private] staff are to be used as teachers.

Co-operation between Faculty and Province in terms of service and teaching loads.

Appendix 2b   Responses during and after a presentation to the
Department of Anaesthetics, 6 August 1999

['Why medical education?']

> *Teach skills*
>
> *Prepare for internship - they don't start becoming doctors until <u>after</u> their degree.*
>
> *There is merit in a university education*

We may as well cut down to three years and avoid the preclinical years altogether.

[Anaesthetic input]

> *<u>Don't</u> train them to give anaesthetics. They are <u>not</u> fit to give anaesthetics in their Community Service [post-intern] year.*

Why if the country is going for outcomes-based education is Continuing Professional Development process-based - if you <u>do</u> certain things you accrue CPD points - ?

No lectures - Hooray!

Is there such a thing as evidenced-based education[¶¶] ? It appears that each educational innovation is aimed at correcting the failings of the last on a "Try it and see" basis. Is there any evidence to support the current lot of changes?

Curriculum 2001[¶¶¶¶] will be very labour-intensive - in terms of people and time.

Are we returning to Aristotle with his group of disciples sitting under a tree?

Has there been consultation about the new curriculum?

> *Graduates, staff and students have all been consulted. [Reply by another staff member]*

Are we able to make a sudden change?

> *This is not a sudden change. There has been a long process of consultation and preparation. [Reply by another staff member]*

[¶¶] A glancing reference to "evidence-based medicine": a controversial idea, much discussed in recent years, that medical practice should be based not on empiricism or experience but solely on 'hard evidence' - preferably the results of randomised, double-blind, trials.
[¶¶¶¶] Not a mistaken reference to the Education Department's Curriculum 2005 but to the Medical Faculty's bid to start our new curriculum in 2001.

It is time that paternalistic attitudes and ways of teaching came to an end - meaning that we determine what to teach and how the students learn. We have to make a major change in the way we teach and think about teaching.
Gps are an important and innovative resource.

How do students progress from one year to the next?

I had to teach myself problem-based learning once I graduated. The 'pyramid of learning' [Increased retention with increasingly active participation] *is really true. I reorganised the* [postgraduate fellowship] *tuts so that they took it in turns to prepare a topic - the consultant was present as a moderator, not to give a talk.*

It's so good that someone is looking at this.

It's interesting to hear what's happening in education.

Appendix 2c   Questions and comments arising in faculty board meeting August 1999
on proposed changes to the rules to allow curriculum changes in 2001

Would classes [year cohorts] be divided into [six] groups to rotate through the modules of a particular year or would they all move together?
Would there be different pass marks for different years in the Progress Test? If all the students take the same test then many will be assessed on material they have not yet covered.

Students are excited about the changes, but have two concerns.
Overlap: What will happen to students who fail the traditional course? Will they be able to repeat material under the old system?
Assessment: If the pass mark for the Progress Test is 50% how can the earlier years pass - they are expected to score 10 - 20 %?

What will be the extent of departmental contributions? [A large clinical discipline] *and its subdivisions [and* [a large preclinical discipline] *similarly] feature excessively.*
What about part-time teachers? Will they need to be trained in the new system?

Will the students cope?
Concerns about implementation - staff numbers; venues; skills laboratory; library.
We do need curriculum reform and vertical integration [of basic and clinical sciences].
[Post hoc: *It seems like change for the sake of change.*]

Assessment: numerical marks have been a problem in the past - e.g. the 49/50% divide.
Would this be an opportunity to change to categories - e.g. Good / Adequate / Supplementary / Fail - might this be less contentious?

From practical experience with the CVS Module[⁂] it seemed to be very labour-intensive because facilitators need to come from the relevant superspecialty; in this case there are few staff available to bear the additional burden.

If the facilitators do not need to be experts in the field, surely they are not necessary?

How does one monitor the facilitators' performance?

How did the marks for the two problem-based modules compare with conventional teaching?

Despite perceived problems with the format, students will be lifelong learners once they have passed through such a system.

It is not clear whether the proposed system will entail more or less work than currently.

The work load needs to be divided equally throughout the faculty.

How many facilitators will be required once all five years are in operation?

Disadvantaged students may struggle with this system. Possibly the rule on exclusion if an aggregate mark of 30 % is not obtained should be softened in the first year.

Initially there will be a lot of work, while the new plus old systems are running simultaneously.

Each faculty member's time commitment must be indicated as soon as possible.

What will be the clinical teaching load on top of facilitating tutorial groups?

Disadvantaged students will surely struggle. Should we limit our intake to those who have at least a year after matric, or even a B.Sc.?

Basic science seems to be ignored - this is not good.

A recent article suggested that expert tutors are better [in terms of their students' results] *than non-experts.*

We need to know what time commitments will be necessary.

Group facilitators/tutors must at least have medical training. They need not be (super)specialists.

Also worried about the lack of basic science.

[⁂] One of two experimental problem-based modules run in 1st and 2nd Year for the past two years

Appendix 2d

Member of a preclinical department. Not actively involved with curriculum reform but responsible for a number of educational innovations in teaching his subject.

Discussion was encouraged around four questions.
Brief notes were taken at the time and transcribed later.

How do you see our role as lecturers? Is this role changing / will it change? Why?

There are differing estimates of whether our teaching load will increase or decrease. Our calculations indicate that for the same number of Full Time Equivalents our load will increase six to ten times. We would need to staff practical sessions.
It is not clear whether we will be needed as small group facilitators or subject experts. If facilitators, it is not clear whether they need to be experts or non-experts. There is a fear of loss of their jobs among non-medics since they would not be able to act as [medical] experts and clinicians in various disciplines might decide that they could teach the relevant aspects of [this discipline] themselves.
The overlap of old and new curricula will mean teaching two sets of students at once.
We have the pressure of other programmes such as nursing and the B.Med.Sci. Would we be expected to drop these to service the increased load of the new medical curriculum?
Lectures will obviously be as before.
[Acting as] facilitators will depend on whether they want experts or non-experts.
It may be necessary to designate individuals as undergraduate teachers - they will be disadvantaged because rewards come from research and they won't be able to do as much of that. It may make sense to divide people into teachers, researchers and administrators - if the university will allow us to 'specialise'. So long as the department as a whole produces the output, why does it matter if we don't all do everything? You wouldn't expect in a [commercial] company that everyone would do everything.
Our teaching style has been changing anyway. We have concentrated on principles rather than detail. Computer-aided learning has changed the way we teach and made it more self-directed. It has also allowed us time to be involved in other courses.
The place where teaching occurs affects how one does it also; if the students are going to be at remote locations, they cannot have lectures - some other way will be needed.

What do you think is driving this process of change? How should we respond?

Things have been changing since 1985 - at least. Paediatrics moved to community-based teaching - it had an element of social upliftment which compensated for the previous governments failings.

It is the direction the world's going. The government is telling us to change. It was thought to be a good public relations exercise - a good advertisement - that we were developing this new curriculum.

It seems to be driven by a few enthusiasts. The majority of the faculty are against change. "If it ain't broke, don't fix it." People would prefer to keep on as is. Large group lectures are far more effective [in terms of use of staff time and accumulation of FTEs].

Which do you think is more important: curriculum content or what staff and students make of it?

As we add new content, we have been dropping old material.

The balance between content and process depends on international norms - for instance [book A & book B^{¶¶¶¶¶}]*'s contents are an international benchmark. If we have covered them, we know we have covered the ground.*

I would teach Zulu, computers, physiology and biochemistry for the first six months in first year to give them a baseline on which to build the rest. They need seven to nine months before our subject begins to be integrated. We teach [one subject area] *at the end of the year because they don't understand the significance until they know about the other relevant areas. We teach* [another subject area] *at the end to integrate lots of different aspects. The new curriculum may integrate* [material] *but it won't integrate subjects.*

Do you think that Anaesthetics as a discipline has a contribution to make in the new system *or* do you think that anaesthetists as exponents of certain viewpoints and certain practical skills have a contribution to make? How do you envisage any such contribution?

You could teach anaesthetics in several ways - as a block or as separate areas.

There are possible links in several places - for example pain. You could have a theme, such as a patient coming for surgery, and deal with relevant issues such as the psychological effects, the physiology, how to deal with the pain in different ways, resuscitation, pharmacology.

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^{¶¶¶¶¶} Two standard texts in this discipline's main subject

I myself am open to change; I'm prepared to accept the word of the experts that this is the way to go - but I find the way in which it's being done a problem. The university is imposing conditions. I have grave reservations about the skills of the people involved. We don't have any real experts in this area. The theory may be OK - I take their word for that - but management skills are needed. [Trying to help materially but frustrated by not being given answers to enquiries about resources needed.]

I haven't answered any of your questions. Thank you for listening to my expressions of anger about this whole thing.

Appendix 2e

Member of a preclinical department. Actively involved in curriculum reform.

Discussion was encouraged around four questions.
Brief notes were taken at the time and transcribed later.

How do you see our role as lecturers? Is this role changing / will it change? Why?

At present we are sorting and selecting information from a number of textbooks - the critical information - and presenting it to the students. Now they will do that [selection] *themselves. There <u>will</u> be a change. I provide a way of classifying information, of structuring learning. I'm not sure that the new curriculum will allow this - an approach to learning medicine. Many of us* [in the faculty] *do this.* [Example of interactive lectures, eliciting information and building on it.] *Perhaps this type of thing should be part somehow of the new curriculum. I had to learn how to learn - studying* [my discipline] *and* [another degree] *at the same time. I realised that principles are more important than details.*

What do you think is driving this process of change? How should we respond?

The volume of information available is far greater than what can be memorised. It is important to know where to find information, not necessarily to know all the facts oneself. We are learning that mankind needs to work as a team. We can pool our information. One person can't know everything.
We all need to keep on learning - to keep up to date.
Most undergraduates are taught by specialists - taught far more than they need to know; this needs to change. The teachers have to differentiate between the basic M.B., Ch.B. knowledge and registrar knowledge; most of them don't do this.
On the basis of educational theory, rote learners are intellectual failures. They can get away with it in first and second year, but not in third year [and beyond].
This is perhaps a political thing, but increasing the number of students means changing the system.
They need an approach [to clinical problems]. *We need trained practitioners.*

Which do you think is more important: curriculum content or what staff and students make of it?

How it's used / presented is more important - but there is a critical minimum content.
We [the Curriculum Development Task Force] have tried to whittle down each discipline's content to a common core. I'm not sure whether we have overdone or underdone that.
How they link one thing to another - the information links are critical.

Do you think that Anaesthetics as a discipline has a contribution to make in the new system *or* do you think that anaesthetists as exponents of certain viewpoints and certain practical skills have a contribution to make? How do you envisage any such contribution?

This is a difficult question. There needs to be part of a module or even a whole module, or perhaps more, of exposure to Anaesthetics. Not in isolation - as part of patient management. The students need to realise the relevance and scope of Anaesthetics. Probably about three weeks would do it. They would cover the pre-operative workup, drugs, post-operative complications..
If a subject is too widely diffused, it may make no impact with regard to learning its principles. If one drinks neat whisky, you can tell which kind you're drinking; if it is greatly diluted in water, you can't tell what it is.
They should be able as community service doctors to give anaesthetics. They need to learn in their intern year, so the undergraduates need to have an idea of the body of skills. This is the case for a number of disciplines - one needs to know how to apply plaster of Paris, how to set fractures..

Member of a clinical department. Actively involved in curriculum reform.

Discussion was encouraged around four questions.

Brief notes were taken at the time and transcribed later.

How do you see our role as lecturers? Is this role changing / will it change? Why?

Yes it will change - especially if you are a didactic teacher. I have no problem if you allow student input and evaluation. Our department has been looking for years at ways of changing teaching. The changes will be different for [different] *individuals. We had no training in adult education; now we are training our registrars and new consultants - teaching them how to teach; for instance how to set a multiple choice question exam. We don't let them lecture out of a textbook - they must include local information and make it relevant to their students.*

Our teaching is case-based, at the bedside. If there is other information, for example epidemiology, that can't be taught at the bedside, we have extra lectures or seminars. We try to bring in other disciplines - we were the first to have clinico-pathological conferences; they were multidisciplinary. We must integrate [the different disciplines].

The students can't dictate the curriculum - they haven't the experience. I allow my students to arrange the sequence in which we deal with the objectives laid down in the book we give them. I let them go on and on but I pull them back if they go too far off track.

What do you think is driving this process of change? How should we respond?

There is a concern with doctors' practice after they leave medical school - GPs and specialists. [I think we have to accommodate people who want to go in either direction.] We want to influence the way they practice medicine, not just to teach them while they're here..

Change elsewhere in the world affects us - younger people in the faculty are aware of this [the old are reluctant to change].

Changing standards of practice - medical audit for example - influence the way we teach.

There are changes in teaching not just in medicine; everywhere.

We don't want to do what everyone else is doing, but what is appropriate for <u>us</u>...with regards to technology, clinical cases...for example, the Part One OSCE [in my specialty] was entirely on computer this time.

I'm not happy with massification - not with regards to changes in teaching but in terms of resources, especially in the changeover period - because we have the [increasing] service load at the same time. We will have to call back the private practitioners [in our discipline] whom we dropped because they haven't kept up with the new teaching - they can at least help with clinical teaching.

Which do you think is more important: curriculum content or what staff and students make of it?

What we do with the content. You've got to decide on the core content, but how you present it is crucial.

We will allow electives so students are able to explore particular areas further.

How other [medical] faculties in South Africa teach does not matter. It may be interesting to see what they are doing.

We need to relate to Department of Health issues, to prepare doctors for their working environment.

Do you think that Anaesthetics as a discipline has a contribution to make in the new system *or* do you think that anaesthetists as exponents of certain viewpoints and certain practical skills have a contribution to make? How do you envisage any such contribution?

Anaesthetics as a <u>discipline</u>. Input from Anaesthetics is absolutely vital - for example: Resuscitation; Pain; Critical Care. This is my particular view, because I've been involved with anaesthetists all my life. I call [B] if I have a problem in [my section of the hospital] and he calls me if he has a problem in theatre and we talk about it. Anaesthetics has an approach to technology - for example in the use of ventilators.
There are also the technical skills - for example, [B]'s work with epidurals revolutionised post-operative care. CVP[†] s I learnt from anaesthetics...
It's not just aspects of the discipline - it's the discipline as a whole...integrated with others.
It's probably the same for all the minor disciplines. You don't have to know all about eye surgery, but you have to know what to do about an eye injury; how to examine the eye; how to prescribe for an eye infection...

Electives are important, offering exposure to the various specialisms.
We must never limit what people can know.

[†] Central Venous Pressure monitoring line - to measure the filling pressure of the heart.

Member of a clinical department.

Discussion was encouraged around four questions.

Brief notes were taken at the time and transcribed later.

[Over the 'phone when making the appointment]: *Why do they have to change things?*

How do you see our role as lecturers? Is this role changing / will it change? Why?

No. It won't change. The information is transferred the same way whatever arrangements are made. We have the facts and we pass them on to the students.

What do you think is driving this process of change? How should we respond?

It comes from the USA. We have a good system. It was developed over many years and it's tested by the exams. This is how you and I were taught. Trauma and HIV are small influences. We teach elements peculiar to our own environment.

Which do you think is more important: curriculum content or what staff and students make of it?

Content. They need to know the material. I don't have any fear of [my discipline] *being lost in the melee. We are training family practitioners and 80%; say 60% of GP symptoms are related to* [my discipline]. *I'm aware of problems in* [another discipline] *where 60% of their patients have AIDS. They are crowding out the others, so there is a dearth of physical signs for teaching.*

Do you think that Anaesthetics as a discipline has a contribution to make in the new system *or* do you think that anaesthetists as exponents of certain viewpoints and certain practical skills have a contribution to make? How do you envisage any such contribution?

Anaesthetics as a <u>discipline</u>. Family practitioners need to know aspects of Anaesthetics. They may work in peripheral hospitals. They need the info to give anaesthetics and to prepare patients for anaesthesia. There are medico-legal aspects - hazards and dangers that they need to know about. Resuscitation is something they need to know.

I think that internship should be two years and they should rotate through Anaesthetics, [my discipline] *and* [Discipline B] *for three months each.*

Staff interview 5

Member of a clinical department.

Discussion was encouraged around four questions.
Brief notes were taken at the time and transcribed later.

How do you see our role as lecturers? Is this role changing / will it change? Why?

It will change dramatically. There is increasing momentum for change. I'm not sure how we are going to cope. We have cut down the number of lectures we give [by more than half] - *which was good to concentrate the mind on what was crucial - but even so we struggle to keep up. I'm worried about the new system - PBL - being more labour-intensive. Lectures are very efficient; you've got all of them there at one time. I've been impressed by their knowledge - through the year in OSCEs and in the exams. It sounds very time-consuming to teach in small groups.*

What do you think is driving this process of change? How should we respond?

The old system we were used to - I came through it myself - there didn't seem too much wrong with it at the time. I think there are advantages to the new system. It reduces the overload. It's important to give people a hook to hang information on. I did wonder whether it was being offered as a way of reducing the burden on disadvantaged students who perhaps wouldn't be able to cope with the same volume of work that we had to - but that doesn't seem to be the case. I think it's thinking educators trying to improve teaching. My concern is that we had a good product with the old system - so why change. I am open to new ideas. I went to the curriculum development meetings to hear what people were advocating.

Which do you think is more important: curriculum content or what staff and students make of it?

Probably with the old system we concentrated on getting the stuff across. The new system is more about concepts. I must say over [several] years of generations of registrars, those from [two particular universities] consistently seemed the best; I think they have more insight into problems - despite having been taught the same load of stuff as [two other universities] who were more hands-on. I cursed and swore on the first day of my internship when I didn't know how to put up a drip - but I learnt. I think the end-product is what's important.

Do you think that Anaesthetics as a discipline has a contribution to make in the new system *or* do you think that anaesthetists as exponents of certain viewpoints and certain practical skills have a contribution to make? How do you envisage any such contribution?

You have a number of important skills to offer but Anaesthetics as a discipline - because they may need to give an anaesthetic in the bush. They are not going to get supervision in the community service year - they must learn anaesthetics before that.

I'm quite anxious about what's going to happen. I think we'll need a generation of doctors to see whether the new system works.

Vth Year Medical Students
Group: 5 females

Discussion was encouraged around four questions.

Brief notes were made - with permission - at the time and transcribed [and rearranged into more coherent groups] afterwards.

What do you see as the purpose of the M.B.,Ch.B. course?

The course is a background - we'll learn most of the "stuff" next year and in the intern year.

With increasing age and experience you get increasing responsibility.

Practical procedures we'll learn when we need them - probably in sixth year.

I just hope I'll be able to cope when they ask me to do things - I guess I'll manage.

You build on prior knowledge which gradually becomes part of you.

You forget when you learned a thing - you just know that you know it.

You remember the preclinical subjects partly by repetition - when you come across the material again in the clinical years - and partly/more because of clinical relevance.

We are aiming at practice in the community.

What do you think is wrong with the present course?

The pure science subjects in first year are a repetition of Matric work and a waste of time.

We're happy with the present curriculum, except for first year.

We were frustrated [by lack of patient contact] *in the preclinical years, but it wasn't a big deal - especially in second and third year, we realised the necessity of those subjects.*

The sequence is important - you have to have a science basis before the clinical years.

We have a [clinical subject] *block in fourth year, then lectures and exams in fifth year, and another* [same subject] *block in sixth year; it means there's a gap between the two blocks.*

The gap is a problem.

The gap between [learning] *a preclinical subject and applying it later in the clinical years isn't a problem.*

The [same subject] *block was our first entry into the wards; it was difficult relating to patients*

and we didn't know clinical techniques e.g. for examining the breast or the thyroid.

Different people do different procedures during the [clinical] blocks - it depends on chance - what patients are in the wards, who takes you on ward rounds.

Clinicians often expect you to know a technique without/ before being shown.

[Some anxiety about what students are *expected* to do/learn in the wards but which is not made clear to them.]

How might we attempt to correct those items which are problematical?

The pure science subjects in first year should be omitted.

Science subjects at Matric level should be a requirement for entry to Medicine. Why would this be an issue?

Introducing students into the wards in third year now will make it easier for them.

Bringing them into the wards in second or - maybe - even first year should make things easier.

Procedures you do during the [clinical] blocks should be regularised. There should be a list of things to do.

Going over things again is important for [reinforcing] *learning.*

What do you know [and what do you think] about the proposed changes?

We've heard about problem-based integrated courses.

We heard about the TB and CVS modules[§] - nobody liked them.

The students were frustrated by the lack of direction.

They didn't like either of them but the TB was better because of the excursions[§§] .

They found the TB module repetitious.

Working on your own isn't a good idea.

It wouldn't help to get the [basic medical] science only when you can link it with a clinical

problem - you have to learn it before. You have to have the basics.

We are very conservative.

But OBE is coming in the schools. That's how things are going.

My younger brother did the CVS module earlier this year and when he was talking to me about

it I was impressed by his grasp of the physiology and pathology.

[§] Two experimental problem-based modules recently introduced in 1st and 2nd Years.
[§§] Field trips to visit TB centres and patients' homes.

Vth Year Medical Students
Group: 6 males

Discussion was encouraged around four questions:

This interview was conducted at short notice, when an opportunity presented itself; notes were made immediately afterwards.

What do you see as the purpose of the M.B.,Ch.B. course?

The M.B.,Ch.B. is a licence to <u>practise</u>.
Education is what you do after you leave school. That especially applies to medical school.
They don't teach us anything practical - like how to fill out all those forms..
We have three clinical years to pick up [clinical skills]*.*
It is an academic education - a very good one.

What do you think is wrong with the present course?

First year is a waste of time.
We have been spoon-fed.

How might we attempt to correct those items which are problematical?
[No specific responses]

What do you know [and what do you think] about the proposed changes?

It doesn't make sense - to start learning about jaundice in first year without knowing where the liver is.

You have to have the basics first - then you revise them in the clinical years.

How can they get rid of one year?

They have non-medics acting as facilitators [in the TB module] *- such as the librarian. How could she sort them out if they go down the wrong track?*

We are just used to the way we have been taught.

They will cope much better with the new system. They will be used to it. They are computer literate. You do your exams on the computer.

Looking up your own information could take a lot of time.

You could spend more time looking for information than reading it.

You would be able to look up as much as you wanted.

You can get a B.Sc. after three years even if you don't finish the course.

If it works it could be good.

Appendix 4a

Questionnaire on undergraduate anaesthesia course
[Summary of replies: Feb.1998, Feb 1999]

Dear colleague

Please take time to consider our undergraduate teaching and what we might wish to achieve by it. The Faculty is in the throes of redesigning the curriculum as a whole, and our discipline will undoubtedly be influenced in some way. It might help us to shape our own destiny to an extent if we have a plan to present when asked to contribute. Some considerations:

- The unequal struggle to cram all of current medical knowledge into our students over six years has been abandoned, and the aim is to turn out, in five years, 'core doctors' [who will then spend a longer period than before in intern-type positions (e.g. 'vocational training') acquiring expertise in particular areas]. What part of the core is anaesthetics and what part(s) of anaesthetics are core?

- The curriculum structure envisaged is a modular form in which subjects are dealt with in (probably) six-week blocks (we would likely share with a couple of 'non-major' surgical specialities and have two-week rotations much as at present). If we had each group of students from 8 a.m. to 4 p.m., without any time outside the block for lectures, would we be able to repeat our entire input every two weeks (possibly, by arrangement with those disciplines sharing the module to schedule all lectures over its duration, every six weeks)?

- Basic science and clinical material will be integrated, the latter illustrating the former in the earlier years and the former reinforcing the latter as applicable. We might offer to help teach aspects of physiology and pharmacology. Conversely, we might find that respiratory physiology is taught in a Respiratory/Pulmonology module and cardiovascular physiology in a Cardiology module, either of which modules may be taught to a given group of students before *or after* they reach our module. Furthermore, the pharmacology of anaesthetic agents might be taught (? by pharmacologists) only within the anaesthetics module. What would we like students to know when they *enter* our module; and what when they leave?

- Given the emphasis placed by the new education authorities on skills - do we teach enough or insufficient? Given the emphasis placed on universities as centres of academic excellence, of nurturing the enquiring mind, of inculcating a habit of self-motivated and life-long learning - can we address these issues; how?

Q1 What broad outcomes (in terms of Knowledge, Understanding, Skills, Attitudes) do we require from a core anaesthetics course at university level? [17 respondents]

How to give a bog std anaesthetic. Check machine. Hold mask; intubate; induce pt; maintain c intelligent choice of maintenance drug + analgesic + muscle relaxant. How to extubate safely.
The concept of anaesthesia as part of the surgical management of patients. The aims of a 'safe' anaesthetic. Basic theory iro pharmacology / physiology / anatomy clinical medicine in administering a safe anaesthetic
In two weeks probably only a strong foundation to build on with regard to further training in anaesthesia (during internship). Strong emphasis on basic and advanced life support which will be of practical importance to newly appointed interns in this country. Brief overview of physiology, pharmacology.
Knowledge That anaesthesiology exists as a discipline. That valuable skills may be obtained from the course. Skills Basic life + advanced life support. Vital signs - monitoring. Airway Mx. Vascular cannulation. Understanding of referral ie GP or specialist; of basic workup prior to anaesthesia in the core / rural setting. Attitudes Respect and understanding attitude toward patients scheduled for anaesthesia.
Basic concepts of general anaesthesia and regional analgesia. Some anaesthetic pharmacology. Monitoring. Airway management. CPR. Fluid management. Pain management
Anatomy, Physiology, Pharmacology applied to anaesthesia. Skills - resus, intubation
Basic knowledge of anaesthesia. Preoperative assessment, Induction, Maintenance, Emergence - for simple cases
Knowledge - Cardiorespiratory physiology / Equipment available for resuscitation. Understanding -

Impact of pathology eg Hypovolaemia / Pneumonia. Skills - Airway maintenance / Intravenous access

Stimulate an interest in anaesthesia for future recruitment of MO's, registrars. Teach basic skills of resuscitation, life support, airway management. Importance of monitoring patients and early detection of complications. Conditions unique to anaesthesia eg MH, scoline apnoea, PDPH. Broad outline of groups of anaesthetic drugs. Not necessary to teach dosages or specific characteristics of each drug.

We are "Perioperative Care Physicians" - v. American, I know but quite appropriate. They will become interns - need to know pre-op preparation & post-op care - fluids / pain etc., Investigations & why, not just "oh, the anaesthetist needs pt to have CXR" - why??

It surely stands to reason that if an individual is taught to do an appendicectomy, caesar, # fixation that he be taught how to stun the patient

By the time a student leaves university he/she should have a reasonable knowledge of basic anaesthestics. He/she should now that it's dangerous to anaesthetise un-supervised. Although anaesthetics is best learnt in a hands on method I think numbers would prevent this. This is not to say that students shouldn't come to OT at all. The practical aspects of anaesthesia should be practiced at intern level + I think 2 weeks is too short. It should be at least 4 weeks + be closely monitored. Basic life support is an essential part of undergraduate training.

Preoperative assessment and preparation of patients for subsequent anaesthetic techniques. Airway management and CPR. Ability to administer basic general and regional anaesthetic to adult, obstetric, and paediatric patient. Ability to insert CVP catheters.

Knowledge of basic physiology and pharmacology. Understanding of CPR, different levels of monitoring. Skills - IV lines, airway management. Attitudes - time is vital in management of a patient

To understand that anaesthetics means intensive care and is not simply learnt or practiced with two weeks knowledge. To be aware of our scope of practice and acquire some basic skills ie general anaesthetics and agents used, regional anaesthetics. Skills eg putting up drips appropriately. Showing basic resuscitation methods

Knowledge - regional - spinal, IV regional. General - likely case scenarios - C/S, Tonsil, Appendix related to previous blocks. Most basic drugs likely to be required to achieve above. Dangerous situations - eg full stomach. Dangerous patients - relate to medicine include unique anaesthetic situations eg MH, Porphyria. Core doctors in periphery are doing spinals / IVRA / Basic anaesthesia. Possible route may be to set these up as case scenarios with points to be learned from each.

Knowledge & practice of advanced life support skills, emergency anaesthesia, regional anaesthetic techniques, how to administer general anaesthesia.

Q2 Bearing these ideas in mind, please work through the accompanying list of topics that we currently cover and give an assessment of the importance of each for this mooted 'core doctor'.

Q3 Having gone over the list - is there anything else that we should include?

If junior doctors are to go to rural areas unsupervised → must be able to do spinal for C/S & intubate a pt to secure an airway (push regional techniques)

iro core doctor; only a small % of doctors will do anaesthetics without further supervised training so anaesthesia could well be regarded as a superspeciality

Assessing & achieving "fitness" for anaesthesia

Medico-legal issues - those that the core doctor should know. Emphasis on safe technique in rural areas / small poorly equipped hospitals. Ketamine anaesthesia. Leave out sophisticated techniques totally, concentrate on basics.

Indications for intubation. Teaching undergraduates to recognise patients with cardiorespiratory instability. To be able to institute appropriate resuscitation methods. Monitoring interventions + the success of these.

Tutorial on indications for intubation (both in anaesthesia and emergency room).

Reg. blocks - not necessary for them to <u>do</u>, but so they know what + why we can block v. specific nerves. Post op pain - grossly inadequate knowledge, esp. when you see what the local surgical registrars write up for post-op.

List is comprehensive enough.

Role of anaesthetists in postoperative care of patients - eg ICU

NO

Rather than splitting up GA into components have series of cases eg basic principles of general anaesthesia, basic principles of regional anaesthesia then anaesthesia for C/section / upper limb fracture / trauma where core concepts from intro lectures are re-emphasised and applied.

No

Q4 Any ideas as to how, in the face of an increasing work load and decreasing spare time, we might go about teaching the material? [Present methods: didactic lectures, printed notes, in-theatre attendance, tutorials]

Interns must actually give the anaesthetic (under supervision ie not just waltz in at 10:30 am & collect signatures)

Combination of lectures & notes but with a greater emphasis on testing knowledge. Emphasis on hands on teaching.

*Video material - illustrating techniques, Mx of disasters etc. Computer based problem solving exercises. Well designed OSCE exams. Group discussions. Confine theatre exposure. Eliminate current system where students perception of the block is that where one acieves a certain number of intubations. *We expose patients to non-informed, potentially disasterous situations by allowing "student" intubations*

Less in theatre attendance - unsupervised. Perhaps a max. of 2-3 days in theatre with a senior constantly taking them around to observe relevant procedures. Tuts. Discussions iro importance & role of anaesthesia

As present (lectures / notes / theatre attendance / tutorials

One or two students attached to & evaluated by a senior registrar [or "senior" JR] - for say 2 weeks.

Theatre attendance. Small group tutorial. Small printed notes

Printed notes to supplement the in theatre teaching

Formal in-theatre discussion with SR / Cons.: Tick list of intubations etc mean they get their 40 & then go on holiday for 2nd week. i.e. attend at 08⁰⁰ hrs just as they would if they were on Prof.Hadley's firm for the week & discuss certain topics (similar to now, but more formal & a test at the end of the week) <u>Exam</u> - not on how to spell Thiopentone, but how much fluid needed for 55 kg post laparotomy etc!

Aside from the medical simulator - none

In theatre attendance could be improved by allocating more after hours time in theatre to students. Perhaps a more co-ordinated approach in OT ie in addition to students splitting up into various theatres during allocated time, they group together for ½ hour + have a specific tutorial on Boyles machine in OT for example.

MCQ's and in-theatre attendance.

in theatre teaching by registrars / consultants. Tutorial on advanced life support. Didactic lectures are a <u>waste</u> of time.

Tutorials based on case scenarios possibly in 2nd half of the block based on case presentations by students based on cases which they have witnessed eg find a C?section get as many details as possible from anaesthetist concerned - present to group + tutor.

OSCE / viva. Patient → problem oriented cases - working thro' problematic cases in a comprehensive manner i.e. incorporating patient assessment, conduct of anaesthesia, suggesting monitoring devices; postop care etc.

Leave the form anonymous if you prefer. Speak to Ted Sommerville if you have any further thoughts. Ta very much.

[Please indicate opposite each item: 0=omit / 1=less important / 2=more important / 3=crucial]

Q2 Current course content:

- Lectures: **[18 respondents]**   Mean ratings
    Generic:
            Anaesthesia and the role of the modern anaesthetist   2.1
            Basic applied physiology   2.1
            Consent and medico-legal aspects   1.8
            Anaesthetic techniques   2.4
            Fluid management   2.4
    General anaesthesia :
            Induction   2.4
            Maintenance   2.4
            Muscle relaxants   2.2
            Reversal and Recovery   2.3
            Monitoring   2.5
            Postoperative complications   2.6
    Local anaesthetics   2.8
    Specialities:
            Cardiothoracic   0.7
            Paediatric   1.4
            Emergency   2.4
            Obstetric   1.8
            Pain management - acute and chronic   1.8

                                                    Mean - Lectures: **2.1**

- Tutorials: - Practical skills:
    CPR: Mouth-to-mouth on dummy   2.7
            Basic life support   3.0   Bag-valve-mask ventilation of dummy   2.8
                                              External cardiac massage & ventilation 2.9
            Advanced life support   2.6   ECG arrhythmia interpretation   2.5

    Airway management   3.0   Open airway on dummy 2.7
                                              Intubate dummy   2.5
                                              Intubate patient   2.8

    Pre-op. assessment   2.3   Visit and assess patient pre-operatively 2.3

    Intravenous fluids   2.3   Put up drip on patient   2.1

    Anaesthesia   2.3   Assessment of depth of anaesthesia   1.9
                                              Preparation, dose calculation,   1.8
                                                administration of induction agents   1.8

    Monitoring   2.4   Attach ECG leads   2.1
                                              Take bp & pulse during case   2.2
                                              [Observe CVP insertion, read CVP]   1.8
                                              [Observe arterial cannulation]   1.3
                                              Monitor patient in Recovery Room   2.5

    Anaesthetic machine   1.7   Check anaesthetic machine   1.8

    Breathing systems   1.7   Maintain spontaneous mask anaesthesia   2.5
                                              Measure tidal volume with spirometer   1.2
                                              Ventilate patient by hand with mask   2.6
                                              Controlled ventilation with ventilator   2.0

    Reversal & extubation 1.9   Calculate, draw up, give reversal   1.8
                                              Extubate patient   2.3

    Regional anaesthesia 2.3   [Observe local block   1.9
                                                "   spinal   2.3
                                                "   epidural]   1.6

Mean - Tutorials: **2.4**   Mean - Skills: **2.2**   Mean - Lectures, Tutorials, Skills: **2.2**

Please indicate the time you have been in anaesthetics *[6 wk - 20+ yr; Mean: 4.7 yr]*   Many thanks. Ted Sommerville

Questionnaire on undergraduate anaesthesia course
[Summary of replies: 1998]

Dear Student

Please help us to re-plan our undergraduate teaching and what we might achieve by it. The Faculty is redesigning the curriculum as a whole, and our discipline will be part of this.

- The aim is to produce, in a five year programme, 'core doctors'

We need to consider what part of the core is anaesthetics and what part(s) of anaesthetics is/are core.

- Basic science and clinical material will be integrated throughout the five years.

We need to consider what students know when they enter our module; and what they would expect to know when they leave.

- Given the new emphasis on skills - do we teach enough or too little?

Given the emphasis placed on academic excellence, of nurturing the enquiring mind, of inculcating a habit of self-motivated life-long learning - can we address these issues; how?

From your experience so far -

1. What outcomes (in terms of Knowledge, Understanding, Skills, Attitudes) would you expect from a core anaesthetics course at university level? **[25 responses]**

Physiology, Practical application, relevance of anaesthetics. Relation of anaesthetics with other courses. Essentiality of students doing anaesthetics which is more of a speciality course.

A student has to be able, after being exposed to anaesthetics, to do some anaesthetic procedure. Theory is important, but not as important as the practical part of anaesthetic.

Basic knowledge of the drugs used in the anaesthetic induction and maintenance of pts in theatre. As far as skills, the first aid resuscitation program could have been more adventerous exposure - rides c medics on ambulances and exposure to real situations.

(1)To be taught and given time to practice to be able & skilled to intubate. (2)To be taught the core anaesthetic drugs - local & GA. (3)To be given time to practise the theory we get at medical school level.

Sufficient knowledge that will help a student to understand all basic methods of anaesthesia. Skills - on how to operate the machines that are used for anaesthesia like Boils machine and others. Students to have a knowledge on how to handle the "emergencies" caused by anaesthesia like hypotension, cardiac arrest, etc.

To know the basics of anaestheics i.e the handling and management of a patient who's undergoing surgery to know risk factor / be able to identify them and to be able to intervene appropriately

By the end of the course I expect to have good knowledge on:1) Administration of anaesthesia and their precise mode of action. 2) Maintening good anaesthesia thro'-out a procedure. 3) Complications that may arise from anaesthesia and ways of dealing with them successfully.

I think skills, knowledge and understanding are the most important because you have to know what you are doing.

To know contra indications for anaesthesia + precautions to take for high risk patients + also to identify high risk patients. How to put people to sleep + to wake them up.

I'd like to know ab☒ all responsibilities that you have as anaesthetics. Ability to perform[?] pre- / intra / & post operatively as an anaesthetics. To know how to handle emergencies.

Basic practical things eg induction; maintenance & reversal & other drugs eg muscle relaxants, necesary for practice of anaesthesia in a setting where I would have to be the 'anaesthetist'. Practical stuff I feel is absolutely crucial & should be bare minimum that students should be taught & tested on.

I would like to be confident in being able to resuscitate a person completely, in being able to manage a patient in an emergency, life-threatening situation. I must be able to identify and use all equipment that is necessary as well as knowing about resus. fluids etc.

Basic life support and advanced life support should be essential knowledge. Induction, Maintenance of anaesthesia + drugs used should not be considered (or unless one chooses to

specialise in anaesthetics. Also, knowing how the Boyle's apparatus works should not be considered cor but basic apparatus like bagging and intubating the patient should. Anaesthetics in my view should be aimed more towards life support and pre and post op assessment of px rather than what happens during op.

Basic understanding of ffg aspects of anaesthetics. - role - technique - induction, maintenance, recovery. Practical skills are of great importance

I expect that we should have enough knowledge and skills in anaesthetics so that we are properly equipped to deal with the situation and set-up in rural hospitals.

To be able to assist effectively in anaesthetic procedures and to make decisions if needs be

Basic understanding of anaesthesiology - practically - complications

I expect to be able to understand and in the absence of an anaesthetist, administer anaesthesia without endangering the patient's life.

Basic life skills eg CPR, intubat" etc ie you ABC's. Local anaesthetics & the GP practice & in the OPD's

Reinforce what exactly is anaesthetics + the uses for it. Know exactly how to go about administering local anaesthetics as well as which one to give. In the event of us having to perform operations in some bundoo place, we should be able to manage giving a pxt a general anaesthetic - which one, how to give it, how to monitor pxt, etc. Basic life support, which we still haven't covered ever though we are now in 5th year.

Emergency procedures should form part of the core. Procedures done only at 2° or 3° levels should be excluded.

Basic information and practical skills that should make us aware of anaesthetics. Course should not be too in depth but contain information that every doctor should know. Details that are too explanatory[?] should not be included.

Uses of anaesthetics, types, mechanism of action, when to use which agents, common practical skills like drips, mixing drugs, assessing patients.

I expect that a student should come out knowing almost everything about anaesthetics

To teach students how to induce + maintain anaesthesia as an MD as they will be faced c situations at rural hospitals where they have to be able to do anaesthetics alone.

2. Bearing these ideas in mind, please work through the list overleaf of topics that we *currently* cover and give an assessment of the importance of each for the 'core doctor'.

3. (After you have gone through the list) - is there anything else that we should include?

More exposure to anaesthetics. Friendly consultants and tutors who are willing to help students. Stress of practicals - teach students how to do basic procedures, not to teach them about complicated anaesthetic machines when they are still undergraduates. I believe it should be done by postgraduates.

Exposure and practice on real people for first aid resuscitation since our class never had first aid teaching in first year.

Most are important & necessary but we are not given chance to take practical aspect of the whole stuff, of which is important, because after completing degree first problem you get is how to intubate a pt, then the rest can fall in to place. NB practical skills should take more emphasis. Thanks for enquiring!!!

None.

No.

No - list is comprehensive.

No.

Nope!

No.

More tutorials.

Class test

[Please indicate opposite each item: 0=omit / 1=less important / 2=more important / 3=crucial]

Current course content: **[26 responses]**

- Lectures: <u>Mean rating</u>
    Generic:
        Anaesthesia and the role of the modern anaesthetist   2.0
        Basic applied physiology   2.2
        Consent and medico-legal aspects   2.4
        Anaesthetic techniques   2.7
        Fluid management   2.6
    General anaesthesia :
        Induction   2.5
        Maintenance   2.5
        Muscle relaxants   2.5
        Reversal and Recovery   2.6
        Monitoring   2.7
        Postoperative complications   2.7
    Local anaesthetics   2.7
    Specialities:
        Cardiothoracic   2.1
        Paediatric   2.3
        Emergency   2.8
        Obstetric   2.3
        Pain management - acute and chronic   2.7

                                                                    Mean rating - lectures:**2.5**

- Tutorials: - Practical skills:
    CPR: Mouth-to-mouth on dummy   2.6
        Basic life support   2.9   Bag-valve-mask ventilation of dummy   2.7
                                                         External cardiac massage & ventilation 2.8
        Advanced life support   2.6   ECG arrhythmia interpretation   2.7

    Airway management   2.9   Open airway on dummy 2.5
                                                         Intubate dummy   2.6
                                                         Intubate patient   2.9

    Pre-op. assessment   2.6   Visit and assess patient pre-operatively 2.3

    Intravenous fluids   2.7   Put up drip on patient   2.3

    Anaesthesia   2.6   Assessment of depth of anaesthesia   2.4
                                                         Preparation, dose calculation,
                                                            administration of induction agents   2.3

    Monitoring   2.7   Attach ECG leads   2.2
                                                         Take bp & pulse during case   2.3
                                                         [Observe CVP insertion, read CVP]   2.5
                                                         [Observe arterial cannulation]   2.3
                                                         Monitor patient in Recovery Room   2.2

    Anaesthetic machine   1.8   Check anaesthetic machine   2.0

    Breathing systems   2.1   Maintain spontaneous mask anaesthesia 2.3
                                                         Measure tidal volume with spirometer   2.3
                                                         Ventilate patient by hand with mask   2.4
                                                         Controlled ventilation with ventilator   2.3

    Reversal & extubation   2.5   Calculate, draw up, give reversal   2.3
                                                         Extubate patient   2.5

    Regional anaesthesia   2.3   [Observe local block   2.4
                                                         "   spinal   2.4
                                                         "   epidural]   2.4

Mean rating - tutorials:**2.5**
                                                                    Mean rating - Skills:**2.4**

Appendix 4c   **Questionnaire on undergraduate anaesthesia course**
                                    1999

Dear Student

                 Please help us to re-plan our undergraduate teaching and what we might achieve by it.
The Faculty is redesigning the curriculum as a whole, and our discipline will be part of this.

- The aim is to produce, in a five year programme, 'core doctors'
We need to consider what part of the core is anaesthetics and what part(s) of anaesthetics is/are core.

- Basic science and clinical material will be integrated throughout the five years.
We need to consider what students know when they enter our module; and what they would expect to
    know when they leave.

- Given the new emphasis on skills - do we teach enough or too little?
Given the emphasis placed on academic excellence, of nurturing the enquiring mind, of inculcating a
    habit of self-motivated life-long learning - can we address these issues; how?

From your experience of the present medical curriculum so far -

1. What outcomes (in terms of Knowledge, Understanding, Skills, Attitudes) would you expect from a
core anaesthetics course at university level? **[34 responses]**

*The information we were given in 3rd year Pharmacology on anaesthetic agents was, I feel, a good
basis and very necessary. Personally, I feel that there is a danger of eliminating too much from
the current syllabus in the interests of shortening/streamlining the MBChB degree - the aim is
not simply to create future G.P.s, although that is what my main ambition is. I believe that in the
remaining 2 years of my degree I still have a great deal to learn about the practical application of
anaesthesia, dangers, C/I, indications, etc, etc. To be honest, the idea of a 'core' course worries
me, since so much which is currently taught will be dropped.*

*The course must emphasise on the proper basic skills that a doctor should have. This is especially
important in those who will be doing their community service in rural areas where an M.O. will "be
every type of specialist"*

*Local anaesthetics   Induction of anaesthesia   Maintenance of anaesthesia   Reversal of
anaesthesia*

*Pre-operative assessment of px,   Induction of anaesthesia (What, when, how, when)   Maintenance
of anaesthesia (What, when, how, when) Reversal of anaesthesia   Complications in diff pxs of diff
anaesthesia → pregnant   medical illnesses   child*

CPR.   Basic Life Support   Pre + Post operatic complications.

*I expect to know about Preoperative, During operation, Postoperative monitoring of pt in relation
to anaesthesia, To be able to intubate patients.*

*To understand & know what anaesthetics is all about. The basics of how the anaesthetic works
especially local (for G.P.s) & extubation intubation IV fluids, preoperative core! You need also to
teach more skills.*

*Students should learn about everything related to surgical patients and anaesthesia from preop
Mx to post-op Mx*

*Role of anaesthetist.   Understanding how anaesthetic agents work.   Practical application -
Anaesthetizing & monitoring a pt.*

*Knowing & being able to choose the correct anaesthetic agent given + patient profile & s/e profile
of the drug & being able to intubate & resuscitate pts & monitor pts under anaesthesia via +
machines available*

*Knowledge of local anaesthesia   a bit of General Anaesthesia   Complications of Anaesthetics
Pain management.*

*To train a Dr (General Practitioner) to be able to administer basic anaesthetic agents in a hospital
setting including Surgery and O&G wards.*

*Drugs commonly used, modes of action and side effects   Indications for various types & the
contraindications.   What we would most probably be using in rural areas and community clinics or*

hospitals.

Basic info on anaesthetics, enough to be able to understand[?] etc principle and build on the knowledge at a later stage. Skills such as how to do locals would be nice.

Basic life support - skills   knowledge of methods available - advantages / disadvantages (of anaesthesia)

Be able to perform local + general anaesthesia   Wake the patient from anaesthesia   Be able to monitor + pt thru Sx

Types of anaesthetic agents + their administration   Side effects and contra-indications (pharmacology) of the agents.

Local Anaesthesia   CPR   Fluid Replacement   Mx of complications: post - Reffoa[?]

Understand Basics of Anaesthesia   Able to administer

What should be taught is basically emergency anaesthetic.

Knowledge of Resuscitation , Fluid Management   Monitoring pxts. as well as identific and mx. of complic.   Students should be able to implement basic mx. principles.

Role of anaesthetics   Methods of administration of local anaesthesia.   S/E of anaesthetics. Emergency anaesthesia.

To be able to perform basic procedures need in relatively small & poor hospitals

Induction of Anaesthesia   Maintenance   Recovery   Monitoring the patient   Which drugs to use and side effects

I aspect to know names of anaesthetics agents commonly used to day. How they are used, & when they are used. 2 Understand S/E of such anaesthetic agents.

Manage acute / emergency patients correctly and efficiently.   ie. - intubation.   - emergency anaesthetic administration, etc   - proper use of local anaesthesia   Not too interested in anaesthetics in the operating theatre.

Would expect it to be more practically-oriented so that we may furnish our skills rather than wasting the 1st lecture on + history of anaesthetics. If we one were interested in + history of anaesthetics, one would read about it in a library. However, good lectures i.t.o. what we would be doing practically would be nice.

How to sedate pts   How to give regional and local anaesthetics   How to do practical skills; intubation, CVP   How to or watch how pt is put under anaesthesia, monitored and brought out of anaesthesia

Knowledge + understanding of local and regional anaesthesia for performing minor procedures (suturing), abscess drain etc). General anaesthesia for emergency surgery (e.g. appendicectomy) Skills: Basic life support - intubation etc.

The general med. practitioner needs core knowledge of anaesthesia in order to pass knowledge onto and advise his/her patients who shall be undergoing a surgical procedure. He/she does not need to know nitty/gritty details like dosaging etc. because he/she in most cases shall never be performing anaesthesia. Unless one is going to be working in a rural area with no anaesthetise avail. will + need arise

Types of anaesthesia (include. indicatⁿ, C/I & S/E)   Methods of administering anaesthesia   Preop assessment of patient & post-op monitoring   Minor anaesthetic administratⁿ procedures Administration of anaesthetics in emergencies

Thorough knowledge of local anaesthetics   General anaesthetics - indications for use, S/E Consent - how to obtain   Knowing that I may one day be in a rural hospital where I may have to serve as the anaesthetist myself, I would hope to have the ability to successful anaesthetise a patient, monitor & maintain this for as long as necessary & have the safe & speedy recovery of the patient.

I would expect to at least have basic knowledge of the anaesthetic processes mapped out in our tutorials on the overleaf. Octha[?] one /the other, the patient would surely suffer.

At the end of the course we should have more practical skills especially relating to life support.

Understand how anaesthetics work and know a few agents that I may be able to use for example in private practice - minor procedures

2. Bearing these ideas in mind, please work through the list overleaf of topics that we *currently* cover and give an assessment of the importance of each for the 'core doctor'.

3. (After you have gone through the list) - is there anything else that we should include? **[17 responses]**

NIL
NO
NO, but may be a more clinical, practical stuff.
I cannot exactly say; for at the moment my knowledge is poor.
No.
Basic & advanced life support should be emphasised and taught > practically   Learn choice of apt anaesthetic agent esp as may req to act as anaesthetist in rural clinics   Taught clear step by step process of anaesthetising a patient while anaesthetists doing so in theatre.
Why are we doing Anaesthetics? Ha Ha Ha Got u ...
-
Nothing
NO
Perform local, general, spinal and epidural
NO
Post-examination BRAAI / PARTY
Pre-exam BRAAI / PARTY
Not that I know off
No.
Practice of minor OT under local anaesthesia.

Many thanks. Ted Sommerville. Department of Anaesthetics

[Please indicate opposite each item: 0=omit / 1=less important / 2=more important / 3=most important - cannot be left out]

Current course content: **[36 returns]**   Mean
- Lectures: rating
    Generic:
        Anaesthesia and the role of the modern anaesthetist   1.8
        Pre-operative preparation   2.7
        Fluid management   2.8
        Monitoring Anaesthetic techniques   2.7

    General anaesthesia :
        Induction & Maintenance   2.4
        Muscle relaxants, Reversal and Recovery   2.5
        Postoperative complications   2.8

    Local anaesthetics   2.9

    Specifics:
        Emergency anaesthesia, Consent and medico-legal aspects   2.7
        Pain management - acute and chronic   2.6

                                        Mean for lectures: **2.6**

- Tutorials: - Practical skills:
    CPR: Mouth-to-mouth on dummy   2.7
        Basic life support   2.9   Bag-valve-mask ventilation of dummy   2.7
                                          External cardiac massage & ventilation   2.9
        Advanced life support   2.5   ECG arrhythmia interpretation   2.7

    Airway management   2.9   Open airway on dummy   2.7
                                          Intubate dummy   2.7
                                          Intubate patient   2.9

    Pre-op. assessment   2.5   Visit and assess patient pre-operatively   2.4

    Intravenous fluids   2.8   Put up drip on patient   2.8

    Anaesthesia   2.2   Assessment of depth of anaesthesia   2.1
                                          Preparation, dose calculation,   2.0
                                           administration of induction agents   2.1

    Monitoring   2.5   Attach ECG leads   2.7
                                          Take bp & pulse during case   2.7
                                          [Observe CVP insertion, read CVP]   2.8
                                          [Observe arterial cannulation]   2.7
                                          Monitor patient in Recovery Room   2.5

    Anaesthetic machine   1.9   Check anaesthetic machine   2

    Breathing systems   2.4   Maintain spontaneous mask anaesthesia   2.3
                                          Measure tidal volume with spirometer   2.2
                                          Ventilate patient by hand with mask   2.6
                                          Controlled ventilation with ventilator   2.2

    Reversal & extubation   2.3   Calculate, draw up, give reversal   2.2
                                          Extubate patient   2.4

    Regional anaesthesia   2.6   [Observe local block   2.5
                                                "   spinal   2.4
                                                "   epidural]   2.5

            Mean for tutorials: **2.5**   Mean for skills: **2.5**

PLEASE NOTE:

1. APART FROM:

    (a) Intubation Tutorials   Thursday week 1 (09H45-11H00)
    (b) Cardiac Arrest Tutorial   Thursday week 2 (09H45-11H00)
    (c) Ward Round I.C.U.   Thursday week 1 (11H00-11H45)
         "   "   "   "   " 2 (11H00-11H45)
    (d) Dental Clinic   Wednesday week 1 (09H45-11H00)
         "   "   "   " 2 (09H45-11H00)

         You will report to theatre each morning at 09H45 and attach yourself to the
    Anaesthetic Registrar doing the list to which you have been allocated.   Before
    attaching yourself to a list introduce yourself to the Registrar doing the list
    and the Consultant in-charge of the list.

2.   If allocated to GS refer to the Consultant in-charge of surgical lists for
    allocation.

         If allocated to S BLOCK EMERGENCIES and there are none in progress take
    the opportunity to look around the Recovery Room.

4.   If allocated to LABOUR WARD join the Registrar doing Epidurals.   If there
    are no Epidurals in progress join the Registrar doing emergency Caesarean
    section.   Ask to be called if any Epidurals are to be done.

5.   If allocated to GYNAE report to the Consultant in-charge of the Gynae list
    who will allocte you to a list.

6.   If you have been allocated to the ELECTIVE CAESAREAN SECTION list and this
    finishes early attached yourself to the Registrar doing N BLOCK EMERGENCIES.

7.   If your list and premed round finishes early attach yourself where you
    think would be best.

8.   You are expected to report for duty daily at 09H45.   During the course of
    the day you will be entitled to take suitable times off for:

    (a) a morning tea break   - 15 minutes

    (b) a lunch break   - 30 minutes

    (c) afternoon tea break   - 15 minutes

9.   You will join the registrar with who you have worked during the day on his
    premed round.   You are expected to remain with him until   at   least 16H00 each
    day.   You can stay longer if you like.

10.   Please make sure that the Anaesthetic Registrar with who you have worked
    enters each day the list that you do, the time you start and the time you finish
    together with any comments he may have and signs the form.

11.   Please have tutorials and ward rounds signed up.

12.   Please hand completed forms to the Departmental Secretary before leaving
    us.

UNIVERSITY OF NATAL   DEPARTMENT OF ANAESTHETIC

4TH YEAR UNDERGRADUATES LECTURES

DATE	TIME	TOPIC	LECTURER
Fri. 4.9.87	0830-0915	Anaesthesia and the role of the anaesthetist in medicine today.	PROF R
Thurs. 10.9.87	0845-0930	Basic Applied Physiology	DR B
Fri. 11.9.87	0830-0915	Anaesthetic Techniques	PROF R
Thurs. 17.9.87	0845-0930	Premedicant drugs and Preoperative Preparation	DR M
Fri. 18.9.87	0830-0915	The Physiology and Practice of Cardiopulmonary Resuscitation	PROF S UN OF WITS
Thurs. 24.9.87	0845-0930	Induction of Anaesthesia	PROF R
Fri. 25.9.87	0830-0915	Maintenance of Anaesthesia including muscle relaxants	PROF R
Thurs. 1.10.87	0845-0930	Reversal of Anaesthesia Recovery	PROF R
Fri. 2.10.87	0830-0915	Monitoring in anaesthesia	DR M
Thurs. 8.10.87	0845-0930	Local Anaesthetics - Pharmacology and hazards	PROF B
Fri. 9.10.87	0830-0915	Spinals and Epidurals	DR M
Thurs. 15.10.87	0845-0930	Postoperative pain management	DR B
Fri. 16.10.87	0830-0915	The obstetric patient and the emergency patient	DR M
Fr. 23.10.87	0830-0915	Anaesthesia for the young and the elderly	DR B
Fri. 30.10.87	0830-0915	Medico-legal aspects and discussion period	PROF R

These guidelines are intended to help you obtain the maximum from your attachment to the Department of Anaesthetics so please read them carefully. If you have any queries do not hesitate to bring them to the attention of one of the senior anaesthetists.

Teaching of Anaesthesia:

You will already be receiving or have received a series of introductory lectures in anaesthesia during the early part of the fifth year of study. These lectures are designed to help you during your two week secondment. Each student will spend two weeks attached to the Department of Anaesthesia. Mondays have been set aside for general faculty lectures and seminars. This means that you have only eight week days attached to the department. Anaesthetics is a practical discipline and while we do not expect to make anaesthetists of you, we hope that you will acquire some of the practical skills as well as an overview of the subject during your time with us. We will also aim to ensure that you become proficient in basic life support (cardiopulmonary resuscitation). In addition you will be introduced to advanced life support (drip, drugs, ECG, defibrillator). As an aid to study, handouts will be provided covering several essential subjects. Your time will be spent in the operating theatre with periods in the Recovery Room, Intensive Care Unit and the wards. A list of practical skills is included in this booklet. Each successful task must be entered by the anaesthetist supervising you. Neither the study notes nor the practical items are all inclusive. The extent of subjects discussed and manoeuvres performed by you depends upon you and your senior.

Apart from completing the record of your activities, you are required to write up five anaesthetic case reports. These should be brief descriptions of anaesthetics that you find interesting, with a short discussion of the point(s) of interest. Each case reported must be visited postoperatively and comment made on postoperative course, management, analgesia etc. You are also required to provide two intensive care case reports. These should be extensive. Your book and all case reports must be completed and handed in before you are allowed to write the OSCE.

Recommended textbooks
An Introduction to Anaesthesiology: Coetzee & vd Merwe
A textbook of Anaesthesia: Smith & Aitkenhead

ASSESSMENT / EXAMINATION
Attendance:
A daily attendance register must be kept and 8 days attendance will be required before a student is allowed to write the end of year MCQ examination. Time may have to be made up at weekends.

Departmental Assessment:
At the end of the two weeks your performance will be assessed and a mark allocated (one third of total) to your book and case reports. At the end of the two weeks there will be an OSCE examination. The OSCE marks will form 33 percent of the final end of year anaesthetic mark. At the end of the year you will be given a 45 minute MCQ paper with 30 questions. This MCQ will make up the remaining 33 percent. Therefore your year's aggregate will consist of 66 marks derived from your performance during the two week block and OSCE plus 33 from the multiple-choice examination at the end of the year. Borderline cases will have an additional oral. Those failing to achieve a satisfactory standard in this oral will be required to return for a further week during their vacation. The top five students will be given a supplementary oral at the end of the year to determine the recipient of the South African Society of Anaesthetists Medal and prize (R500).

> **This book must be handed in to the Department on completion of your block. You will not be allowed to write the OSCE if you fail to hand in your book.**

ATTENDANCE REGISTER

DATE	HOSPITAL	SUPERVISOR'S SIGNATURE

CARDIOPULMONARY RESUSCITATION

1. Introduction and Basic Life Support

   ....

2. Advanced Life Support

   ....

Mouth-to-mouth on dummy   _____ _____

Bag and mask ventilation of dummy _____ _____

External cardiac massage and
ventilation on dummy   _____ _____

Open airway on dummy   _____ _____

Intubate dummy   _____ _____

IN-THEATRE TUTORIALS

(Ask a senior anaesthetist to go over these topics with you.)

Monitoring:
   Purpose, apparatus available,
   significance of measurement   ....

Defibrillator   ....

Boyle's Machine:
   Purpose, attachments, checks   ....

Breathing Systems:
   Types and uses   ....

PRACTICAL SKILLS

Visit and assess patient in corridor or ward.

....

Put up drip on patient.

....

Attach leads and get ECG trace.

....

Preparation of, calculation and administration of induction agents.

....

....

Assessment of depth of anaesthesia prior to surgical stimulation.

....

Take Bp and pulse during case.

....

Maintain mask anaesthesia and monitor bag movement.

....

Ventilate patient by hand with mask

....

Intubate patient.

....

Muscle relaxation. Reversal and extubation.

....

Monitor patient in recovery room (until discharge)

....

Observe local block

Spinal ....
Epidural ....
Other (specify) ....

Observe central venous line insertion. Read CVP.

....

Observe arterial cannulation ....

CASE REPORTS

Case reports may consist of a combination of the following:

1. A simple anaesthetic without intubation
2. An anaesthetic with intubation and spontaneous respiration
3. An anaesthetic with muscle relaxation and controlled ventilation
4. A gas induction, eg. paediatrics
5. A crash induction ('full stomach')
6. A caesarean section
7. Any special case
   Open eye, head injury, neurosurgery, thoracic surgery etc.
8. Any case where complications are present pre-operatively.
   eg. jaundice, hypothermia, hypotension, difficult airway etc.
9. Any case where complications occurred intra-operatively.
   eg. extra systoles, bleeding, endo-bronchial intubation, oesophageal intubation etc.

DEPARTMENT OF ANAESTHETICS

5TH YEAR UNDERGRADUATE LECTURES

DATE	TITLE	SPEAKER
25/1/99	Anaesthesia and the Role of the Modern Anaesthetist	Professor DA R
1/2/99	Pre-operative preparation	Dr I O
8/2/99	Induction of Anaesthesia Maintenance of Anaesthesia	Dr M S
15/2/99	Muscle Relaxants Reversal & Recovery from Anaesthesia	Dr E H
22/2/99	Local Anaesthetics	Dr T S
1/3/99	Monitoring	Dr W
8/3/99	Fluid Management	Dr RC B
15/3/99	Postoperative Complications	Dr S B
29/3/99	Emergency Anaesthesia Consent and Medico-Legal Aspects	Dr C D
12/4/99	Pain Management – Acute & Chronic	Dr E H

MONDAYS – 10h45 - 11h30 = 45 minutes
Venue: L4 lecture theatre