An evaluation of the reform of the Liverpool Medical Curriculum

Thesis submitted with the requirements of the University of Liverpool for the degree of Doctor in Philosophy

By

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January 2008

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Chapter 9. Consultant Supervisor Interviews.

This chapter will summarise a total of 54 interviews held with consultant educational supervisors (see chapters 1, 2, 3, 5 and 7 for a discussion of the role of educational supervisors) during the summers of 2002 with supervisors who had worked with one cohort of RMC graduates as PRHOs (Watmough *et al* 2006 e) and those held in 2003 with supervisors who had worked with two cohorts of PRHOs from the RMC. This chapter will examine how the interviews were organised, the results of the interviews and how they fit into the overall hypothesis of this thesis.

Purpose

There were two overriding aims to the interviews. The first was to ascertain their views on the competencies of Liverpool graduates from the RMC as PRHOs, the second was to gather their views on the content and structure of the RMC and their views on curriculum reform.

The Interviews

During the summer of 2002 interviews took place with 38 educational supervisors from eight hospitals in the Mersey Deanery area: Aintree, Alder Hey, Arrowe Park, Countess of Chester, The Royal Liverpool University Hospital, Southport, Warrington and Whiston. Sixteen took place in the teaching hospitals and twenty-two in the district general hospitals. Fifteen were with consultant surgeons, twenty-three were with consultant physicians. The interviews took place in the period June – September

2002 and as such were either close to the end or just after the end of the 2001-2002 PRHO year. Therefore the supervisors had as much time as possible to work with the new cohort before being asked to comment on their performances.

In 2003 interviews took place with sixteen educational supervisors from seven hospitals: Aintree, Alder Hey, Arrowe Park, The Royal Liverpool University hospital, Southport, Warrington, and Whiston during the summer of 2003. Seven took place in the teaching hospitals, nine in the district general hospitals. Five were with consultant surgeons, ten were with consultant physicians. The interviewees had all experienced working with two cohorts of graduates from the RMC.

The supervisors came from a wide variety of medical and surgical specialties and sub specialties including supervisors from the newer PRHO rotations in paediatrics, accident & emergency and obstetrics and gynaecology. Also included in the list of interviewees were clinical sub deans and the overwhelming majority of supervisors interviewed were involved in teaching or supervising undergraduates on the Liverpool course. The consultants were all also experienced at working with Liverpool graduates. The average time as a consultant working in the Liverpool area of the interviews in both 2002 and 2003 was just over 8 years. The 2003 interviews took place to see if there were any differences in perceptions between the competencies in the first and second cohorts from the RMC and to triangulate any possible differences in data between the questionnaire data from those cohorts. Also, spreading the interviews over 2 summers allowed more volunteers to be interviewed.

The supervisors weren't asked specifically to compare TMC and RMC graduates. Prior to the interviews it was felt to be unfair to put interviewees in a position where they were asked to compare PRHOs when they may have worked for 20 years or more with pre-1996 curriculum graduates. However, all the consultants volunteered to make comparisons and this will be referred to in the analysis and the conclusion to this chapter.

Recruitment of Interviewees

When the questionnaires were distributed (see chapter 5) to the educational supervisors a reply slip was included in the covering letter (see appendix C) inviting supervisors to volunteer for an interview and inviting them to leave contact details. In 2002 54 supervisors volunteered to be interviewed. Each of the supervisors was contacted three times using the details given on the reply slip and if it wasn't possible to arrange an interview after three attempts were made by SW then no further contact was made. Contact was made either by phone call or email direct with the consultant or as more generally happened through their secretary. Three were arranged in 2002 but were cancelled by the supervisors due to clinical commitments leaving a total of 38 completed interviews. In 2003 35 supervisors volunteered to be interviewed, including a number who had already been interviewed in 2002 and these were not interviewed again. The final total of interviewees in 2003 was 16. The interviews took place with the supervisors in their hospital offices and generally lasted 30 - 45 minutes. Anonymity was offered to all participants.

Pilot interviews

Twenty three pilot interviews were arranged in 2001 just prior to the first cohort of the RMC graduating. These pilot interviews asked supervisors to comment on the competencies of the TMC graduates and speculate about the competencies of the RMC graduates (Watmough *et al* 2002, 2003). The summaries of these interviews are not included here as the supervisors when talking about the competencies of the RMC graduates in 2002 and 2003 happily made comparisons with the competencies of TMC graduates. Seven of these pilot interviewees also took part in the in the interviews summarised here. The aim of the pilot interviews was to ascertain whether the supervisors would be comfortable talking to SW about the competencies of their PRHOs and that they could distinguish between Liverpool graduates and those from other medical schools. It also showed that there would be more than enough volunteers to reach a saturation of themes.

Analysis

The analysis of the focus groups has already been outlined in more detail in chapter 4. The qualitative analysis in this thesis follows the framework approach (Ritchie & Spencer1994) which requires the objectives and themes of the research to be determined prior to data collection. These themes are listed as the interview questions on pages 245 and 246 below.

All of the interviews were transcribed word for word by SW. After each interview brief notes were made by SW briefly summarising the interviews. The transcripts

were read for familiarisation and then the framework was applied as outlined in chapter 4. Initially, the framework was based around the pre-determined questions and then the parts of the transcripts which didn't fit in with this were placed into an emerging theme category and code which was then applied to the transcripts. The transcripts were then indexed and the data put into "manageable pieces" so key themes and ideas could be retrieved for full analysis and writing up the results. Although Ritchie & Spencer (1994) don't explicitly mention "codes" in the same way as Miles & Huberman (1994) calling the process "indexing" and then "mapping" and placing the data into "manageable chunks" and this is in effect is what Ritchie & Spencer advocate. Within the original questions "codes" were decided on and these codes, "manageable pieces" or "chunks" became subsets within the original and the emerging themes. At this point associations between the data codes were looked for and made. For example, some of the comments made by the supervisors concerning communications skills or the "shadowing" placement and also related to comments about how well prepared they felt the graduates were to work as PRHOs. Also, comments which related to the overall performances of RMC PRHOs were separated from those which compared RMC and TMC graduates. The themes and codes relating to the interviews are illustrated in appendix G. All the transcripts were re-read through at the end to make sure that all sections had been included coded or indexed within the framework and nothing had been left out and were referenced with the notes that were made at the time.

The interview transcripts generally yielded 3000 – 6000 words per transcript. To make the analysis more manageable they were analysed over a 3 year period, so the pilot interviews were transcribed and analysed prior to the interviews with those

supervisors who had worked with one cohort of the RMC graduates and these in turn were transcribed and analysed before the interviews with those supervisors who had worked with two cohorts of RMC graduates. The supervisors of this thesis checked the transcriptions to cross-reference the codes and analysis of SW.

The covering letters which accompanied the questionnaire distribution were signed by the Mersey Region Postgraduate Dean and the Director of Medical Studies (see appendix C). However, the SAE for the questionnaires and reply slip was addressed to SW and the letter made it clear he would be arranging and undertaking the interviews without the knowledge of anyone else. The possibility of bias in the interviews was reduced by the fact that the replies went to SW and he dealt directly with undertaking the interviews (Norris 1997). Also, SW alone carried out the interviews and SW prior to undertaking the interviews was generally unknown to the supervisors and was not in a management position within the University.

The number of interviews more than ensured a saturation of themes. With a homogeneous group of research participants saturation of themes can be reached very quickly (Kvale 1996) and often after 15 – 20 interviews. However it was important to interview more than that for a number of reasons. It was necessary to gain a representative mix of views about the PRHOs and curriculum reform from as wide a variety of specialties as possible and from all the main hospitals in the region which supervise Liverpool undergraduate students and PRHOs. Politically, it was also important to interview as many supervisors as possible since it was known that there were a number of supervisors in the Liverpool area who were hostile to the RMC so there couldn't be seen to be any discrimination against volunteers. Also, it was very

difficult to get a saturation of themes on the issue of science knowledge base. There were plenty of volunteers from the newer PRHO specialties such as A & E and paediatrics and it was important to gather their views along with supervisors in the traditional PRHO posts in medicine and surgery. There were fewer interviews with supervisors in 2003, but as will be demonstrated in the results there were no differences in the views of those who had worked with one cohort and those who had worked with two cohorts of RMC graduates.

For the purposes of presentation and the attributions of quotes the supervisors were numbered in the order the interviews were transcribed which was roughly in the order they were undertaken. Numbers 1 – 41 were interviewed in 2002, 42-59 in 2003. Numbers 3, 9 and 25 from 2002 and 46 and 56 from 42-58 are GPs and their comments are included in chapter 10.

Questions

The interviews were semi-structured with the following basic questions put to all those who took part:

How well prepared were the Liverpool graduates from RMC prepared for the PRHO year overall?
What is their basic science knowledge like?

Do they have good communication skills?

Are they aware of their limitations?

Do they have good interprofessional understanding?

Can they take a good history and relevant clinical examination?

What are their attitudes like?

Has there been any change in their learning style as a result of curriculum reform?

What they felt about the old traditional Liverpool course/ did they feel was it time to change the curriculum?

What would they do to improve the course?

Of the skills and attitudes listed on the questionnaire which ones do they feel are the most important/ appropriate for PRHOs?

In general how well prepared were the RMC Liverpool graduates to work as PRHOs?

The above general question was put to the supervisors to "kick start" the interviews. When answering the opening question, the majority of supervisors volunteered comparisons between RMC and TMC graduates. Considering they had only been exposed to one or two cohorts from the RMC, many of the supervisors had very fixed opinions about their abilities. The overwhelming view from the majority of supervisors was that they had been well prepared as PRHOs and they were better prepared for the role than TMC graduates.

I think they have been very well prepared actually..... I mean, certainly this year I have had four outstanding house officers who have been as good as anyone I have worked with over the last twenty years. (Supervisor 15 2002 Surgeon(S))

I think they are extremely well prepared and having had the shadowing they know what to expect. (S41 2002 Physician (P))

I have not detected any signs that they are worse than previous house officers. (S42 2003 S).

.And having had experience of the previous PRHO I would say that this current lot are far better prepared for the job than their predecessors... we haven't had any worries about the competencies... (S4 2002 P)

I think they have done generally well; there is little doubt about that. (S23 2002 P)

They are quite safe as far as the patients are concerned.....(S45 2003 P)

The housemen that we get now – the majority are very good indeed. There are one or two who aren't so good, but the majority are very good indeed. I was concerned when the curriculum changed and the people from the new curriculum came through we wouldn't get the same quality of housemen. They have been very high right from the start...I can honestly say they are every bit as good as the housemen who came through previously. (S57 2002 P)

Generally speaking I have found them pretty good. (S11 2002 P)

I think they have been well prepared, yes, the new shadow system is very beneficial. (S30 2002 P)

I think they are better prepared now than PRHOs starting 4 or 5 years ago. I think they were peculiarly badly prepared at that stage.. weren't getting the experience of students locums and ..hands on work.. they were quite unprepared for the actual PRHO job..... I think the new system has actually helped.....come in with a greater understanding of the job. (S48 2003 P)

One urologist was even pleasantly surprised *I think they are actually quite good... I think they have been not too bad really, not as bad as I expected.* (S18 2002 S)

A small number of supervisors pointed out that whatever type of curriculum there was there would be "good" and "bad" graduates.

There are occasions where there are sorts of holes or gaps in their knowledge. What I find difficult is – I am sure there were holes in the knowledge of the old lot and it is difficult, I find it difficult to know whether that is really different or not. As in any year there are some students better than others. (S53 2003 P)

Some supervisors felt they were much better prepared for the role of PRHO despite voicing some concerns about basic science knowledge base.

I think they are better in many ways. I think they are better equipped to know what to do on a ward because they have been on the wards a lot more than they used to be. I think they lack some of the basic knowledge that perhaps they should have...clinically I think they are... well prepared. (S45 2003 S)

I think they are well prepared – they are certainly more enthusiastic.. they are coping well, practical skills are better, but the knowledge isn't like it was... (S29 2002 S)

To be specific I think there is no doubt the new ones are better prepared in terms of practical procedures and knowing how a ward works. They come, they hit the floor running.. communication skills better than before.... But they are undoubtedly weak on factual knowledge (S51 2003 S).

I think they are well prepared to be house officers. I think one has to realise that there are some gaps in their knowledge, but then they have got skills that the previous

house officers didn't have, communication being top of the list.... They know what they are doing when they come for the first day. (S1 2002 P)

However, less than a fifth of the consultants said they didn't meet their expectations of a House Officer at all or that they were worse then the TMC graduates. Only a small number felt they were not well prepared and were less well prepared than TMC graduates.

On the whole not as well prepared as previously their general medical background knowledge is not as good. They are more clued up in some respects, I suppose communication skills are better, but they are not as good. (S47 2002 S)

Not at all well. There are huge gaps in their theoretical knowledge which is worrying if you get called to a sick patient in the middle of the night...and you have no idea how to assess fluid balance or prescribe it accurately.... you are a danger to the public and some of these people are. (S32 2002 P)

There were other comments that were very much specialty-related and certain supervisors made comments that weren't mentioned by other supervisors. For example one supervisor had experienced problems with PRHOs, but that was a localised problem in a particular specialty in one hospital. One surgeon said that the first rotation of House Officers he had hadn't performed too well, but the 2nd rotation graduates were better than TMC graduates. There was also a physician who didn't feel on the whole the RMC was preparing graduates particularly well and when interviewed said he had witnessed a PRHO on his ward from the RMC who was struggling. However, he then went on to say about the house officers he was the named supervisor for:

Of the four we have had this year, three have been very good and one has been outstanding...the best ever. This is often held up as evidence that the new curriculum is terrific, but if you ask that lady what she thinks of the curriculum she is not that impressed. (S19 2002 P)

When answering the opening question a number of consultants made reference to the clinical and communication skills of PRHOs without being specifically asked about them and these comments are covered later in this chapter. Nearly all the supervisors also discussed the importance of "shadowing" without being specifically asked about it.

The shadowing to me is a very good idea, exceedingly good idea. That, to me is a very good and practical step to reassure them they are not just going to be let loose in the world. (S2 2002 S)

I think the most useful thing we have at this moment is the shadowing. (S49 2003 P)

The shadowing is really good and caused a "seamless switch over" which enabled them to hit the ground running, even the nurses commented how good it was this year. (S6 2002 S)

The shadowing is brilliant, I don't know why we didn't bring that in years ago. (S42 2003 S).

In a similar way to the shadowing, supervisors also felt that the final year SAMP attachments offered students good preparation for the PRHO year. In fact the structure

and content of the final year was seen as good and the clinical experience was an advantage.

The SAMPs I have found to be very stimulating and I think that is a totally enjoyable teaching approach. (S14 2002 P).

The SAMPs, shadowing and final year help them acquire the skills they need. (S 43 2003 P)

Knowledge base

During the interviews 3 main areas concerning knowledge base were discussed - the actual knowledge of the RMC graduates regarding basic sciences (anatomy, physiology, pathology, pharmacology etc.) per se, whether the graduates had the requisite knowledge to perform as a PRHO, and whether the supervisors envisaged any problems as their career progresses beyond the PRHO year, particularly when it came to studying for postgraduate exams. As will be illustrated in the following section, the "knowledge issue" from the consultant interviews is the most complicated issue to be raised in these interviews.

Many consultants believed that RMC PRHOs had less science teaching than previous graduates, in fact the majority recognised this and welcomed the fact they had been "taught" less. There was no unanimous view on the knowledge base of the traditional curriculum graduates.

I have not been appalled at their basic knowledge at all....about the same (as the old) – all pretty mediocre. (S37 2002 S)

Another consultant said that there was no diminishing of knowledge compared with previously and there has always been "fragmented knowledge" of physiology or understanding disease processes anyway.

As has already been shown above, some supervisors felt the RMC graduates did have some deficiencies as PRHOs.

Their knowledge of prescribing knowledge is deficient and you could say their knowledge of basic science less good than in the old course. (S1 2002 P)

However this supervisor, in the long term he didn't feel they would be too disadvantaged when it came to sitting their postgraduate exams. *I don't believe they will be at a disadvantage, you have to go back to the book work anyway.*

About a third of those interviewed didn't have any concerns whatsoever or felt there had been any diminishment between lecture based and PBL curriculum graduates.

I am not struck by any difference in knowledge base, I can't discern any difference between old and new. (S 44 2003 P)

My current one (house officer) is extremely good. He knows the relevant basic science to underpin what he needs to do as a houseman. (S36 2002 P)

Some of the physiology is quite hard and I can't discern whether they are any better or worse than previously. (S48 2003 P)

I think on a practical basis it is good if not better than their predecessors. I think.... The anatomy might not be as good, but the applied anatomy is good if not better (S15 2002 S)

One surgeon told how it wasn't really an issue for him. *Well, the basic science, anatomy and physiology knowledge I don't get to, or question the house officer too much about that....my priorities are patient management.... .I am not sure if it is of particular relevance to this group of junior doctors. I think if one wanted to take them to task about their basic science knowledge to prove a point... if I had a biased view of the new curriculum as terrible I could prove that by taking them to task, but I think one could take to task many SHOs or people who were under the old curriculum...* (S6 2002 S)

In a similar vein another surgeon said

that you have to recognise they know "different things" and if as a consultant you question them on their knowledge it shouldn't be done as if they are a "traditionalist". (S16 2002 S)

One physician said that they may or may not know less...*if you ask me to quote the course of the lingual nerve I wouldn't know where to begin, but rather like these students I know where to get it. So I think we have to be careful about these shotgun criticisms because I think the individuals who make those kinds of judgements are making a kind of emotive judgement rather than a critical evaluation.* (S41 2002 P)

However about a third of the interviewees did express some serious concerns, although the following quotes represent the more extreme views.

It is across the board; they have no understanding of human disease or how the human organism works for that matter.... So I would say they are less knowledgeable than someone with an A level in say biology or zoology (S10 2002 S)

They have no idea about bacteria, so they have no idea about bacteriology, they are sadly lacking in pharmacology of common drugs or even pathology itself I don't think they are well versed on... so basic sciences, I don't think they know quite so much of anatomy as they used to do or anything like that. (S 19 2002 P)

Others were much less critical but still worried by the science knowledge of RMC graduates.

If they get a module on dyspnoea and they have to read up about lung volumes it is not quite as high as it may be and in the old days when you had a 2-year course in physiology and you were taught in a lecture and learned by rote. So on the whole on the surface they are very good, they can do all the history clerking and all the examination and interpret it reasonably well, bearing in mind everything that has gone down anyway across the board and housemen are expected to know less than they did a few years ago, but there seems to be odd gaps here and there. (S 43 2003 P)

One did not need the detail that I learned...now that was over the top in that direction but not learning anything at all is over the top in the other direction. (S 49 2003 S)

Other consultants who saw problems with knowledge didn't put it directly just down to the basic sciences but the way they deal with patients and recognise disease and diagnosis. *The most obvious holes are lack of experience of examining patients with clinical signs, they just haven't seen patients with bronchial breathing problems....big liver due to secondaries...big spleen due to leukaemia...* (S32 2002 P) Two other

consultants believed that the students who have worked hard during the course have a good knowledge base, but those who coasted they have concerns about and that because the assessment procedures were "tighter" under the old course they would have had to have worked harder.

A few consultants did feel that it may take a little bit longer for the RMC PRHOs to pass their Royal College exams compared with TMC graduates. One of the supervisors explained that when he took his exams at SHO level he revised by working through the clinical examples of the basic science whereas the RMC graduates may have to revise both aspects. Also, some interviewees pointed out that unless the format of the exams was changed to suit their undergraduate education it would take them a little longer or that they may have to work a little harder. Nobody, it should be reiterated felt they would find them insurmountable or affect their long term career.

It will be harder work for them, but it will be no harm, you know, it is just doing it at a later date. (S23 2002 P)

In the end, though, it was only a minority of between a quarter and a third who had "real fears" about their future careers.

I do have anxieties about how they will perform at postgraduate diploma exams if they want to do them. (S51 2003S)

I think they will have more work to do when they do postgraduate exams because I think their depth of knowledge is not as much and they will have to work a bit harder, but it is not beyond them that is for sure. (S12 2002 P)

Those consultants who really had concerns about their knowledge obviously feel it really the RMC graduates may struggle to get through their Royal College exams. All the interviewees (who were traditionally educated) reminisced about when they undertook their exams and the work they had to put in and the fact they had forgotten or not picked up the basic sciences from their curriculum. One surgeon, after saying that knowledge level of the PRHOs was poor stated, that that he had learned all the anatomy he needed as SHO.

My own anatomical knowledge as a student was atrocious. It was absolutely dreadful, I didn't know a lot as a student. (S58 2003 S)

However, a number of the supervisors did mention that the PRHOs knew less, but didn't see this as too much of a problem and, as has been illustrated above, many supervisors felt they had been better prepared to work as PRHOs despite talking about some perceived deficiencies.

One physician, who wasn't unduly concerned about their basic knowledge level, agreed with one of the focus groups, that the Royal College exams haven't "caught" up with the PBL style of assessment: *You do still need all that ridiculous information that you crammed yourself with in the old course* (S57 2003 P).

Others felt RMC PRHOs might take slightly longer than TMC graduates get to the point where they felt able to take their postgraduates exams and

the stage at which they become a good diagnostician and clinician from a physician's point of view I think is going to be later on than previously. (S7 2002 P)

and they would be able to pass their exams because

They will definitely have the ability. Absolutely – that is the other plus point in the course I think, in that these new House Officers, are aware of how to do literature searches, how to find knowledge which previously they had no idea.

Other supervisors also felt that the RMC graduates would be able to acquire knowledge which they needed for postgraduate exams.

A good student, a good doctor will pick up what they need to know. (S57 2003 P)

I think you can fill in the knowledge gaps along the way and I am expecting that is what will happen. They will fill in the knowledge gaps on the way.... I am hopeful they will end up probably better than the old way of training people which was pretty staid and traditional. (S14 2002 P)

They will just get down and do the work. Everyone who is reasonably intelligent will.. what they have to do and what hoop they have to jump through. (S54 2003 S)

The majority of supervisors felt that, although the RMC graduates didn't have the knowledge level of the RMC graduates, this hadn't affected their ability to work as PRHOs. The only real concern about their ability to perform as house officers was over pharmacology and prescribing, with over a quarter of interviewees raising concerns about these aspects.

One physician – one of a few who has felt they have been impeded at PRHO level - said it was because ... *their basic science knowledge is a little woolly.....I think it effects their ability sometimes to interpret results.. for example acid base balance and electrolyte balance...* (S30 2002 P)

Another physician commented that their poor anatomy was exposed when looking at x-rays for example, another said that instead of making a differential diagnosis they would pass on decisions, but as will be discussed later in this chapter, this is more likely to be due to the prevailing trend in the NHS for juniors to "pass the buck", and is actually more related to hospital policy rather than a specific curriculum issue. It could be that the "knowledge" issue is being tied in with what many consultants see as a trend in junior doctors "passing the buck up the line" when it comes to diagnosing or making interventions, although, as has been illustrated, there is a feeling that PRHOs from the new course do "know less" in this area. It is generally recognised by the interviewees that PRHOs have less responsibility for medical decision-making than they did say 20 or 30 years ago. In one instance a surgeon complained about the decision making of SHOs at the Liverpool Women's hospital over the last few years. These were SHOs who would have come from the traditional course or a different medical school, as graduates from the Liverpool RMC hadn't reached SHO level at the time the interview was undertaken.

Anatomy was the basic science that was singled out for particular criticism and seen as the weakest from both physician as well as surgeons. Pharmacology raised the most concern after anatomy, and physiology was seen as the strongest individual science. Others were more bothered about particular sciences and one surgeon commented that

he felt they had a much smaller grasp of microbiology than previously, but this was due both to the course and the advances made in this field recently. He then went on to say that the PRHOs were good at prescribing but not good at therapeutics and were "fine" with general physiology, but were weak on anaesthetic physiology.

Some supervisors just had one or two knowledge issues to raise depending on their speciality. For example one surgeon said they done really well as house officers but he felt that they, compared with graduates from the TMC, didn't really have a good enough anatomy base, but they make up for any "knowledge gap" with their enthusiasm to work Another surgeon said their anatomy was fine but their clinical examination skills could be improved. It appeared that some supervisors felt there was just "something missing" compared with previous graduates regarding knowledge and making slight alterations to the course could rectify this.

There were more examples of "mixed" messages. For example one physician after saying they are lacking in physiology and anatomy, then said *I think for the clinical diagnostic type of thing I think they are better than the old ones.* (S36 2002 P) Another physician said that although they seemed to know less about, say, heart valves or kidney function, *I don't think that translates into poor patient care because they pick up what they need to know.* (S57 2003 P)

The above point is key to the whole debate – there was generally a consensus that the amount of science teaching should have been cut from the levels it was in the TMC but not by how much. Despite the many comments it should be remembered that only

a small minority felt any knowledge deficiency would seriously impede their progress as physicians or surgeons.

One surgeon concluded a question about science knowledge by saying.

By the time they get to their house jobs by and large I have to say they seem to be able to cope with most of the basic science things, they obviously don't know as much detailed anatomy and biochemistry and physiology as I did when I qualified as a houseman. Obviously the vast majority of that knowledge I don't use on a day-to- day basis and therefore it may or may not be stored in my brain if I need it. But I certainly need to look most of it up again if I need it. So I think by the time they get through to house jobs they seem fine. I think some of the students struggled early on but I think that seems to be improving. (S55 2003 S)

Communication skills

The vast majority of supervisors saw the RMC graduates as being very competent regarding communication skills and were more competent at communicating than the TMC graduates.

They are much better than the old. They have an understanding of verbal and non verbal communication. They understand listening. It isn't just about speaking. (S14 2002 P)

I think for the first time ever patients have commented on the abilities of the PRHOs to get communications right... We never used to have that, the PRHOs were almost mute most of the time with patients and relatives and that is one of the enormous plus points of the new curriculum. (S37 2002 S)

I think Liverpool is very good in the communication skills and I think it is one of the things where they need a pat on the back really. (S52 2003 P)

Some supervisors when asked this broadened it a bit further and said that has been seen when they present either on ward rounds or presenting to public audiences.
Good, I would say – very good. Both with patients and if they were sort of presenting or presentation skills I think are good. It is definitely better. (S18 2002 S)

Others commented on how well they communicated with other members of the team
Good, good. The majority of them are very confident, not over confident, you know confident communicators.... work well as part of the doctors, medical team, they work well with the nurses and they are able to communicate with nurses and they are able to communicate with the patients. When I was a houseman you were on duty a lot more and the speed of things was slower so you got to know the patients much better, they don't have that advantage.. I think they do very, very well. (S45 2003 P)

One surgeon commented she was surprised by how well one of her PRHOs had broken bad news and dealt with a patient when an emergency admission was diagnosed with inoperable cancer
she handled a difficult situation really well.(S37 2002 S)

Even those opposed to the new course or who saw the graduates as poor thought this was a strength. *Yes now those are good... , the one really positive thing I can say without doubt about the new bunch is that they are much better at, sort of interpersonal communication with the patient.* (S57 2003 P)

A small number of consultants felt they couldn't comment on communication skills as they didn't really see their PRHOs communicating, and one consultant even said that it was unrealistic for consultants to comment on this.
I would be cautious about anyone who says anything in that regard. (S58 2003 S)

There were only a couple of complaints and one was from a surgeon who felt they said too much to patients, where it would be more appropriate if someone more senior was there as well. Another who saw the classes as a waste of time said, *what I do see is them communicating as well or as badly as the previous lot without anything to say. (S20 2002 S)*

The supervisors felt that the communication skills classes seem to given the RMC graduates more confidence and has made them appear more competent when working as PRHOs. The mainstream view was that the communication skills classes in the new course were overdue and were definitely necessary and was one the real plusses of curriculum reform.

It was something that needed doing, there are those in the profession who have been very poor at it for a long, long time and that is something the profession as a whole

needed to come to grips with.. it is good that PBL has allowed that to happen. (S50 2003 P)

Interprofessional understanding

There were no reported problems in this area and generally speaking, not only did the Liverpool graduates work very well with other professions, the supervisors also felt that RMC graduates understood the roles of the other professions compared with when they arrived in their first PRHO post. It was also felt that they didn't just understand the role of the health care professionals they recognised the importance of their roles.

Yes, team working is very good – they know how to work with the teams and other co-workers, not only that they respect the co-workers. (S17 2002 P)

They understand multi-disciplinary work and being part of the team. They understand the value of the other professions more, nurses and therapists more than they previously would.. the importance of team working, that is obvious now. (S27 2002 P)

Yes, they are aware of the multi disciplinary nature, they are probably more aware than I was when I came through my training. (S48 2003 P)

They come through a bit more aware of the team working whereas in the past it was the doctors, now the team is the whole. (S55 2003 S)

Attitudes

The supervisors were asked about what they felt the attitudes of the PRHOs were like. Although it could be argued that attitudes are more down to the "individual" than fashioned as a result of the curricula, many supervisors believed the RMC graduates displayed appropriate attitudes on the wards. Only a handful of supervisors mentioned problems. Of those who did one appeared to be surrounding a local issue in a particular hospital rather than the curriculum, one was concerned with their dress sense and one supervisor said

I am still not of the opinion that the newly qualified doctors come onto the ward with any sense of urgency and commitment they should have. (S23 2003 S)

The majority were very favourable.

Very good, excellent, again I have odd problems in the past which I have always attributed to personalities...grown up I would say, grown up with common sense are the words that spring to mind. (S20 2002 P)

I think they appear to be a good bunch. (S1 2002 P)

Yes, no problem, They seem quite willing to learn, quite willing to be on the ward at the appropriate times. (S15 2002 S)

I am struck by their enthusiasm... they are not clock watching. (S35 2002 P)

Again I would stress that I think we get a committed bunch and any shortcomings are more than compensated by their keenness and their commitment. (S42 2003 S)

They have good attitudes, they adapt very quickly, very focused.... Excellent the majority of them so that is not a problem and I think is a compliment to the new course. (S45 2003 P)

Some consultants, who despite saying the work and attitudes of the PRHOs were fine when they were on the wards, felt that they were perhaps a little too keen to leave when their shifts ended.

The good ones and we have had some very good conscientious people who stay over the hours until the job is done, but there is much more a feeling of clearly my shift is over and you can't blame them. (S31 2002 S)

This is also very much tied in with the new EU working time directives which appears to be of concern to numbers of consultants (Leinster 2003). The supervisors who felt the PRHOs keenness to leave when their shift is over was related to legislation regarding junior doctors working hours. A small number of the consultants did say that by the final year and PRHO year new curriculum students seemed less "jaded" or "ground down" than TMC graduates when they started the PRHO year.

Being aware of their limitations

The majority of supervisors believed that the graduates from the RMC were "properly" aware of their limitations and this was a good trait to have as a PRHO.

I think they are, my experience of my housemen is that they know when to call me or the registrar.. they don't try and take too much on.. they take on a lot more to the

relatives than I did as a houseman and they will still encourage the families to see someone more senior so I think they are very aware of their limitations yes. (S49 2003 S)

I think they are aware of their limitations, yes I think they are more confident because they have done the shadowing. (S57 2003 P)

The PRHOs also know when they need to ask for help.

Yep I think they are fairly good at that as a general thing yes. Yeah they are good at asking when they need help. (S1 2002 P)

A very small number of supervisors felt that junior doctors tended to ask for help too often but the majority were happy for them to do so as one physician said

If anything I prefer it if they ask more questions than less. (S7 2002 P)

I think they are very good at recognising their limitations. I don't see anyone coming in thinking they are above their station, they have a grasp of what they cannot do. (S16 2002 S)

They are very aware of what they don't know and in medicine that has always been an advantage in any aspect of medicine including mine. (S39 2002 P)

No longer are they are literally, young Turks. (S17 2002 P)

There were only a small number of consultants – those who had a concerns over basic science knowledge - who didn't see being aware of limitations in a positive way and felt that they were "over" aware of their limitations.

Generally yes, but their limitations are so vast that awareness isn't very helpful....(S10 2002 S)

Clinical skills

There was near unanimity amongst the supervisors that the RMC graduates were very competent in this area and better prepared than TMC graduates for carrying practical procedures such as inserting venflons, venepuncture and catheterisation.

I think they are fine on that. I think they have all been through extensive clinical skills training and they are prepared for those elements, yes. (S13 2002 P)

Well they are better than they were, yes. I mean the basics they need like cannulae and catheter they are much better at than previously. (S17 2002 P)

There haven't been any problems, there hasn't been any complaints.. they have been much more hands on than previous ones.. they actually know how to measure blood pressure properly which previous students didn't know because it wasn't taught properly at Liverpool. (S 27 2002 P)

One physician said how he noted his PRHO undertaking a perfect lumbar puncture at the first attempt whereas he had "botched" six attempts before he got it right, another said he hadn't seen a venflon until he was qualified.

There were consultants who felt that, until the RMC was introduced, the teaching of students and their ability in this area was on the wane.

They are very good at those things; I was worried a few years ago but have noticed the students are getting better at these things. (S54 2003 S)

We were all worried that practical skills were on the decline because students weren't allowed to do practical skills but that seems to have gone the other way again and they have been allowed to do practical skills again and that is great. (S43 2002 P)

The supervisors linked these improvements in competencies to the introduction the RMC. Many consultants felt the RMC students learned their skills in the Clinical Skills Resource Centre or when they were shadowing or during the SAMPs in the final year.

That is good, that is very good, yes. I remember a few years ago my housemen would come to the ward and they didn't know how to put a venflon in, now they know all these skills. They have been taught. When they are doing the shadowing and the SAMP they learn all the clinical skills - that is definitely an advantage. (S15 2002 S)

I think they cope very well with that. I haven't seen any problems there because they have the skills lab don't they and that is a big improvement. (S 55 2003 S)

The early exposure to clinical skills and the breaking of the clinical/pre-clinical divide through the Clinical Skills Resource Centre was welcomed by all supervisors and is recognised as one of the strengths of the RMC.

If you want to talk about what is really good about the new curriculum you have to mention the clinical skills lab. (S31 2002 P)

Some consultants felt they were unable to comment on how their PRHOs performed practical procedures as they never directly witnessed them being undertaken but were sure the nursing staff would have alerted them if there were any problems.
I don't hear of any problems, but remember much of it is done by nursing staff, so these are the things that senior nurses on the ward will have a much better idea and knowledge of than I do. (S6 2002 S)

When discussing the practical skills it became clear that different consultants had different expectations from each other about which skills they expected their PRHOs to be able to undertake. This is further illustrated by their views on the content of the questionnaires (see pages 291-293 below for a further discussion about this). The supervisors were divided over whether they felt that PRHOs are expected to undertake ECGs, for example. One consultant said he didn't look for any practical skills at all, another thought that the ability to take bloods was all they needed. Also - even though it appeared on the questionnaire list nobody expected their PRHOs to be able to suture or insert a nasogastric tube.

We don't expect anything other than relatively simple skills. (S17 2002 P)

I don't necessarily expect them to be able to put catheters in or central venous lines.. as far as putting nebulisers on - the nurses do that. (S20 2002 P)

However, despite the limited expectations by some of the supervisors, the introduction of practical skills training in the RMC curriculum is seen as a very positive development and the majority of supervisors had noticed a marked improved in the RMC PRHOs.

History taking and examination skills

An important part of the PRHO year is the ability to be able to clerk patients on admission into hospital. The mainstream view was the RMC graduates were very strong in this area.

They are very good at clinical examination compared with, because as opposed to the previous curriculum they are now taking history from the very first year. Clinical examination is also very satisfactory, yes. (S28 2002 P)

I would say our PRHOs take a history and examination in a much more robust and well presented way than the high flying chap from Oxford.. very good as well. (S 14 2002 P)

Many supervisors felt that history and examination skills were good in the TMC graduates so were pleased that the standard hadn't dropped.

I have found them remarkably good at history and examination, they have done a good job and I haven't found a significant difference between the previous curriculum and this. (S55 2003 S)

The majority seem very comfortable and competent – like with the previous curriculum. (S43 2003 P)

I think history taking is fine...they have clearly had reasonably good training and they are more aware of the non-presenting complaint history, in other word the past histories and the social histories and the context of that patient and I think they are much more aware of that than some of the old PRHOs. (S53 2003 P)

There seemed to be a strong correlation between their improved communication skills and history taking skills and some consultants felt the OSCEs helped encourage history taking and examination. Even the consultants who couldn't always see the PRHOs undertaking these skills felt they were good because they could check the notes to ascertain their abilities at history taking and examination. One supervisor said that the patients had not complained to him about the PRHO examination which they would have done if they had felt it was poor.

Although the vast majority of interviewees saw examination skills as being at the necessary standard, there more worries expressed over examination than history taking.

I think history taking is one of their strengths actually in, certainly in fact in 4th and 5th year they are very good at taking a history.. almost at the exclusion of other things.

There was also a correlation between those who felt they had a poor basic science knowledge base and those who expressed concern about examination. This only tended to be a minority of supervisors, about 25% who had real concerns about science knowledge base.

They don't understand what the history is about. So they go down the history and they wonder why they don't know what is going on and then they do an examination, but they don't know what they are examining. (S32 2002 P)

One physician suggested that history and examination skills were perfectly adequate but the PRHOs weren't sure what to do with the information once they had extracted it stating that they can take a history and an examination with no real problems. Therefore he was saying that some PRHOs couldn't use those skills to form a proper diagnosis or suggest treatment. Another physician said that the history was "fine" and the detail was good and the examination "very reasonable" but when it came to the differential diagnosis they would often refer that for senior review. This has been highlighted in chapter 7 and will be examined again in the conclusion to this chapter.

However, it only tended to be the minority of supervisors with real concerns about their knowledgebase who had concerns about examination technique. The overwhelming, general view was that they the RMC PRHOs were at the required standard for history taking and examination.

<u>"Learning skills"</u>

As has been illustrated one of the key goals of a PBL curriculum is to engender lifelong learning skills in to the students. Many supervisors were unhappy or

uncomfortable with the term "self-directed learners" so the question, instead was framed to ask if they had noticed any differences in the learning styles of PRHOs or students from the new curriculum. Apart from one consultant who said *No, but how do you measure that? I think to screw up a course by doing things which can't be measured is completely arrogant* (S10 2002 S) many supervisors had noticed some change.

In fact only 14 of the supervisors had noted no differences between TMC and RMC PRHOs.

There is the bit about the pre-conceived notion that they would be more motivated to find things out and better tooled up to do it. I am not impressed that is the case. (S8 2002 P)

By the time they get to the final year they are using the same textbooks as the other students and they are reading lecture notes and they are reading them in exactly the same way as the other students. (S48 2003 P)

Encouragingly, the more mainstream view is that the majority of supervisors had noticed some difference in the way the RMC graduates gathered knowledge or the way they approach learning, gather information or undertake written work/assignments.

There is definite evidence that the new curriculum students can think for themselves, they can certainly write better as a whole across the board. (S36 2002 P)

Yes, they are certainly more motivated to think for themselves. (S31 2002 S)

Yes, I have absolutely no doubt that of the strongest things to come out of the PBL course is that- they know how to go and seek out knowledge and information and I think that can only be good for them, but whether that has converted itself into habit only time will tell. (S17 2002 P)

Some consultants felt they were able to present clinical findings better and were far more comfortable at utilising IT and more "interactive" in classes (as students) and through the SSMs they were better at carrying prompt literature searches.

I know from having been a clinical sub dean for many years what the course involves and am fully aware of what opportunities are out their way and how they are taught to learn, so I am confident they will be better self-directors of learning, yes I am confident of that. (S40 2002 P)

One surgeon commented that the students now were more willing to see the PRHO year as an extension of the undergraduate course and carry on learning than they did in the past. Many also commented, that given the opportunity as undergraduates, the students prefer bedside teaching as it had been under the traditional curriculum rather than going away and researching it. Those supervisors who do sense that they have "better" learning skills believe that will benefit them when they come to sit their royal college exams. Many felt that the RMC students are better at undertaking literature searches.

I think there might be some differences, I think they understand how to get stuff out of the literature, what the literature search is, that they use search engines I don't know.(S58 2003 S)

There are supervisors who have noticed that the PRHOs are more inquisitive and "less accepting" than previously which they believed was due to curriculum reform. They are more questioning which is good, I think under the old system they would take what you say without questioning it. (S41 2002 P)

PRHOs are more willing to ask questions now than they ever were and I think that is a really positive thing. (S50 2003 P)

Curriculum reform in Liverpool

In order to gain further insight (as outlined in chapters 1 and 3) into an evaluation of the curriculum the interviews also focused on the views of the supervisors about curriculum reform and in particular whether they felt that it was time to replace the TMC in Liverpool. Nearly all the supervisors were happy that the sheer volume of lectures and "overburden" of facts had been reduced although, as will be illustrated on the following pages, some supervisors felt it had gone a little bit too far in the other direction.

However, only a small number of supervisors wanted to keep the TMC as it was and the curriculum was generally viewed as being in need of reform.

The old course which I was involved (I was a lecturer), ... was dreadful. The course was a very traditional course with as much anatomy as the professor of anatomy could eke out. (S38 2002 P)

The Liverpool course when I came down in 1987 was really appalling...really bad. I came from a place that was really progressive – Aberdeen, a place very much into medical education and moving things forward. (S21 2002 P)

There were also concerns that the traditional course was failing to produce PRHOs who met the expectations of the public who today have different expectations about their doctors, particularly over communication.

I think the traditional course had to change because it propagated a set of values that perhaps weren't as PC as it were.. Dr Lancelot-Sprat sort of thing is more or less dead so I think it had to change from that point of view. (S49 2003 S)

There were of course varied views on the nature of change. A number of consultants would have preferred a more evolutionary approach to curriculum change.

I think it could have evolved rather than being chucked out. There is an element of chucking the baby out with the bath water. (S51 2003 S)

But even supervisors who didn't like certain aspects of the RMC felt that it was time to reform the TMC. There were others who wanted change, but were not happy with the outcome. One surgeon after stating that the old course had to change saying

It was awful. It was what I call big bang, they could drift through 5 years of doing absolutely no work whatsoever and they would have one massive exam, (S55 2003 S)

but then when asked what he thought about the new course said

I am an old fogey and totally prejudiced against it.

But even consultants who don't particularly like the present structure of the RMC felt the TMC should have been reformed.

The old one was as good as anywhere - it was satisfactory. I think change had to happen, but I am not sure whether such drastic change was, but perhaps it had to change to see how much change was needed. But change was needed, no doubt. (S22 2002 P)

They don't come crammed full of lots and lots of information about trivia which I could argue as a strength (S1 2002 P)

It would also be fair to say that the majority of supervisors were not "evangelical" about the curriculum change, i.e. they weren't actively campaigning for reform. They recognised (some with the benefit of hindsight) that the TMC as it was couldn't have carried on *ad infinitum*, even though the change was perhaps too radical for their expectations. Interestingly, only a small number of consultants actually tied the curriculum reform to *Tomorrow's Doctors.* Most interviewees seemed to view reform in Liverpool almost in isolation, rather than as part of wholesale changes in medical education in the UK and the rest of the world.

Well I suppose, when I first started the same views as everybody else, you have done it for 150 years why do you want to change it now? What I think was it needed tweaking, not revolution...there is probably a happy ground in the middle somewhere. (S30 2002 P)

Views on PBL

There was a whole range of opinions on PBL and how it is applied in Liverpool and some supervisors admitted a certain amount of ignorance about PBL.

It is difficult because I have never done it.. so it is difficult to know what is going on in one. (S11 2002 P)

For the majority having problem-based learning in the curriculum was welcomed.

Philosophically I think it is better; when they leave the nurturing environment that is medical school they have to take responsibility for their own learning...doctor appraisal in the future is going to be based upon keeping up their knowledge and skills. (S 35 2002 S)

I think the problem solving approach is what I do as a surgeon so I intuitively quite like it .(S37 2002 S)

Well I have never been through a PBL as such although in many ways it is what we do on some areas of clinical medicine, certainly in a lot of areas if research. .. you sit down you have a problem and everyone contributes to it and that is what a good ward round is, that everyone is contributing to that problem. (S48 2002 P)

This doesn't necessarily mean a large number of supervisors welcome the amount of PBL in the RMC overall or that the supervisors felt that PBL should be the pre-

eminent way of teaching the basic sciences. For example, one physician thought it would be useful to use PBL to teach ethics, but not the basic sciences. Most supervisors wanted more "traditional" methods alongside PBL or instead of PBL in the early part of the course for teaching basic sciences. Much discussion took place over how much PBL there should be in a medical course and what it should be used to teach, although many supervisors appeared to have a different interpretation of how PBL works. There was no consensus about exactly how much PBL and other pedagogical tools should be used. Of course, inherent is a misunderstanding of the way PBL should work in practice and it has already been shown that there can be different interpretations of PBL (Maudsley 1999). Some supervisors also expressed concern that some students would work very conscientiously, others very little and this is what leads to concern over knowledge levels. Everyone seemed to have a different opinion on "how much" PBL there should be in the curriculum. A very small number were against PBL on philosophical grounds. The majority, though did recognise that a PBL course – or at least having some PBL in the curriculum - does have advantages for medical students' learning

It is good, but I think the trouble with PBL is that it depends on the motivation of the individual - it is clear that some do it conscientiously and some hardly doing it at all. (S33 2002 P)

Too much of it, whilst it is a good way of learning, it is not necessarily an efficient way of learning it is a good discipline of people seeking after information but if you

are seeking after information you need a good knowledge base to assess where the information fits. (S58 2003 S)

PBL is an excellent technique and I think what we should be looking for is a bit of balance from all these different methodologies to produce people who can do all the things we need. (S38 2002 P)

How the supervisors felt that the RMC could be improved

All the recommendations of individual supervisors cannot be included here, but it is possible to decipher some common themes. No supervisors gave exactly the same recommendations of how they felt the course could be improved. Pleasing every consultant's exact wish for the new curriculum would prove impossible especially as some of the recommendations were related to specific specialties.

Everyone had a slightly different take or emphasis on what changes they would introduce. The most suggested improvements were for more "directions", "signposts" or "structure" in the first couple of years of the course. This could either take the form of lectures, more "structured" tutorials, more science "demonstrations" or more "practical" laboratory sessions. Many consultants also wanted to see a return to more "bedside" hospital teaching alongside the PBL and more anatomy or physiology exams to "consolidate" knowledge retention. Another suggestion, which for some supervisors would negate the need for lectures or tutorials, would be to have consultants or GPs tutoring PBL sessions and allowing them more of an input so the

students have more guidance (in their eyes) of reaching the required learning objectives

.. so they don't have to spend 5 hours getting 15 minutes of knowledge which I could tell them in 15 minutes. (S32 2002 P)

It was also felt that an "expert" facilitator would make sure the students came away from the PBL scenarios with the necessary underpinning science. Some supervisors gave more suggestions for change than others. There was no specific consensus on how to improve the course, everyone had slightly different ideas regarding "signposts".

I would introduce a few rote lectures to cover the core subjects, so they have got no excuses to say we didn't cover this in PBL... yeah I wouldn't make it a big deal – the odd lecture maybe one day a week to cover the core stuff.(S20 2002 P)

..tutorials as well, in those lectures I don't think you gain much... I wouldn't go back to all those lectures, but some way of exposing them to respiratory physiology to important biochemistry. (S42 2003 S)

Not necessarily lectures..... may be working in smaller groups, which is generally better for learning, if you can organise it. (S8 2002 P)

I think identify a core knowledge that needs to be taught formally and then apply that in problem-based learning. (S35 2002 S)

I think with a bit of tweaking here and there ..... I think you could have the best of both worlds, I think there are some big plusses with PBL and I think there were still some good bits in the old type of course.... I think there is a place for lectures and tutorials. (S52 2002 P)

But the key point to remember here is that apart from a very small number of supervisors no-one was advocating abolishing PBL within the course, just adding some "signposts" the PBL. The supervisors felt that some of the things that they thought were good in the TMC could fit in alongside the PBL sessions.

Just one or two lectures a week in the first couple of years telling them the broad sense... not in the depth we used to have, I mean I don't remember the 115 enzymes needed in the breakdown of glucose. (S32 2002 P)

The second most suggested improvement was to reduce or restructure the amount of community teaching in the RMC. It was generally realised by the majority of supervisors that the amount of primary care teaching had to be increased, that the 4 week GP placement in the TMC was inadequate and that now students had a better understanding of primary care. Although many supervisors acknowledged that about 50% of medical graduates will go into primary care, many supervisors, after welcoming the increasing exposure to primary care medicine, then said that there was too much primary care teaching. One surgeon said he wanted it reduced because *if you are in general practice there will be a surgery in the morning and a surgery in the afternoon. General Practices don't keep lots of patients warehoused between surgeries, in hospitals... advantages of patients sitting in wards.* (S5 2002 S)

However, even the surgeon who gave this view could recognise that the number of hours in the community had to be increased compared with the old curriculum and the interviewees were not against an increase in primary care teaching, especially as it was seen as too under represented in the TMC.

It is not a bad thing there is 30% as over half of them will be GPs anyway.

I think there is too much really..not because community isn't important....but I think in terms of skilling people up to a difficult ways of managing a messy, demanding career I don't think General Practice is the way to do that. (S32 2002 P)

The place where you get your clinical experience is in the hospital...it is not the 7 minute consultation with a lot of similar people in General Practice... (S55 2003 S)

Apart from the small number of consultants who would abolish the 5th year GP placement and replace it with an extra shadowing block these criticisms centred on years 3 and 4, in particular the 4th year. In essence those who felt there was too much community felt there was not enough "bedside" teaching in the RMC. There were also consultants who whilst not necessarily agreeing that there should be less community teaching and recognised that the majority of graduates will go into primary care did express concerns about the timetabling of community placements. Consultants would prefer it if both community and primary care placements took place "separately", rather than the students leaving the 4th year hospital attachments one day a week to spend time in primary care. This was seen as an impediment to teaching in the 4th year when the continuity aspect of the hospital placement was broken.

Another issue raised by some consultants about the community was that students should learn their examination skills in the hospital setting or the specialties and then take what they learned there into the community, not the other way round. If the community time was cut down it would be envisaged they would have more bedside teaching in the hospital and more experience of the more "typical" diseases such as different cancers and various cardiovascular diseases. One physician would reduce the amount of the community and make sure all the students spend some time on placement with the "ologies" (sic) as he put it; ophthalmology, neurology, cardiology, dermatology, and pathology. *To assume that ophthalmology can always be taught by general practitioners or diabetologists (sic) is just not appropriate....*(S32 2002 P)
Others as well felt that students would learn these more thoroughly and pick up examination skills quicker in the hospital setting.

Also, many supervisors had heard from the students that the teaching quality from some GP practices was poor.
The GP attachments I don't have much experience of, but the feedback from the students is that it isn't very useful. (S21 2002 P)
There were of course some who had no real problem with the community part of the course
We get a jaundiced view about what undergraduates should be doing because of our specialty and even if you asked GPs they might think they spend too much time in the community, you know it is a Swiss roundabout. (S15 2002 S)
But this was a minority view. Also, it should be pointed out that only one consultant was advocating a move back to "old days" when students only had 3 weeks in the undergraduate course in primary care and apart from that surgeon, no-one had any

doubts that the amount of community teaching had to increase. Of course some would (and did) argue that this is "natural hospital bias" and the vast majority of patient contact happens in the community, but these views are echoed by the PRHOs (see chapter 8) who may have been influenced by these views.

The supervisors do not see the RMC as the finished product and expect it to evolve. As will be considered in the main conclusion to this thesis the curriculum has been altered since data collection. Many educational supervisors made recommendations about how the course could be improved but were not entirely sure of the exact content of the course. Outside the University there seemed to be a certain amount of misunderstanding about what exactly the course consists of. For example three consultants said that there should be an Accident & Emergency placement timetabled within the undergraduate curriculum, not realising there is an existing eight-week Accident and Emergency attachment in the final year. One supervisor "vaguely" remembered receiving literature on the course, but was unable to find the time to read it. Many were unaware, for example, that there are plenary sessions running concurrently alongside the PBL scenarios and the teaching opportunities available in the Human Anatomy Resource Centre or the organised biochemistry and physiology practicals. They were also unaware of the changes that had occurred since the curriculum was introduced, despite that fact the all the supervisors interviewed are in some way involved in teaching undergraduate students.

Another area seen for improvement by a number of supervisors is the assessment procedures. Again, there were different views, though not a great desire to return to

the old final examination system. Ideas ranged from altering the RITA forms to testing them after each PBL scenario.

Some more academic hurdles among the good things that PBL brings. (S27 2002 P)

Many supervisors expressed reservations about the final year portfolio. This has been covered in more detail in other projects (Brown 2005, Chamberlain 2006) which have shown that the many supervisors displayed a negative attitude to the portfolio. Many supervisors were unhappy that there were no "final" exams in the final year and didn't have faith in the portfolios. However, as has been noted in chapter 8, the PRHOs had little faith in the ability of their supervisors to use the portfolio properly and these interviews and the other studies have demonstrated this. Also, some supervisors felt that having more "signposts" along with the PBL included more assessments so the students would be "forced" to focus their science learning. There was a feeling from a number of supervisors that the highly motivated candidates could - and did - do extremely well, but the "average" and poor students need more of an incentive.

The SSMs overall were seen as a positive development and were enjoyable from both the supervisors' and students' point of view. Some supervisors, though, did feel that perhaps SSMs assumed too much importance instead of "traditional" exams and there might be too many SSMs in place of more "structured" teaching. However they did feel that SSMs helped improve the students' literature searching skills.

One of the things I have noticed about the students is that they are more au fait with the literature, they understand what I mean by the literature.. you know that was foreign to some of the other people including myself. (S57 P 2003)

However, despite the many suggestions on how to improve the course, there was only one interviewee who could say nothing at all positive about the RMC, and few felt that the TMC could have carried on indefinitely. Although a large number weren't "campaigning" for curriculum reform when it happened many are content that change has happened and would just like to see more "structure" using the methods discussed above.

Views on the questionnaires

The majority of supervisors were asked to comment on what they felt were the main skills and attitudes listed on the questionnaires which they felt were most relevant to PRHOs (see appendices A and B). Twelve supervisors weren't asked due to time constraints. The consultants gave a varied degree of answers. Twenty-one of the thirty-one skills and attitudes listed on the questionnaires were mentioned in this response and many also gave their views on the content of the questionnaires. One supervisor refused to complete his questionnaire as he didn't agree with something that was based on a list compiled by the GMC. Another consultant after saying what he felt was important for PRHOs said

there is a lot of drivel here. Coping with uncertainty – how do you do that? It is just bunk...what does managing time mean?,.. appropriate attitudes personal health? Crap! What is evidence- based medicine? (S1 2002 S)

Some consultants looked for the attitudes of their House Officers above anything specifically on the questionnaire. *The best combination is to be nice – an unbeatable combination so to do that they have to have a decent attitude, courteous to the patient and their colleagues and a willingness to learn.* (S17 2002 P)

Table 26 Number of questionnaire citations per variable by consultants

Questionnaire variable	Number of consultants (n =)
Communicating effectively	32
Working in a team	25
Aware of limitations*	22
Diagnosis, decision making and the provision of treatment including prescribing	17
Managing time effectively	15
Understanding disease processes	14
Keeping accurate records	7
Basic CPR	7
Venpuncture	6

* a number of consultants also cited knowing when to ask for help which can be seen as equivalent to being aware of limitations.

The other variables were cited less than 4 times. In fact very few mentioned practical skills or procedures as what their highest priorities for PRHOs. The reason for this being that these kinds of skills could actually be taught during the PRHO year if necessary. Twelve of the variables listed on the questionnaires weren't mentioned at all. Amongst those variables on the questionnaire not mentioned specifically at all by any consultants were "providing appropriate care for people of different cultures", "understanding peer review and audit", and the majority of the practical skills listed on the 2nd page of the questionnaire. Many consultants, when asked about the specific clinical skills "take it as read" that they can do what they consider the more "basic ones" such as CPR, venepuncture and arterial blood sampling. Again, there was no unanimity about which skills they should be able to do as many consultants said that either nurses or technicians undertake ECGs and nurses would put in nasogastric tubes.

Apart from one physician who said *they are all important how can you decide which is the most important* (S44 2003 P) the other consultants were happy to pick out the skills which they felt were most valuable and some gave more general comments.

If you get a well-organised houseman who knows how to use the laboratories, who works in a team, communicates well.... and communicates well with other members of the team you have a good houseman. (S51 2003 S)

If you communicate, work as part of a team, manage your time effectively then everyone else should fall into place. (S43 2003 P)

It is clear that "communicating effectively", "being aware of limitations" and "working in a team" are the most important skills which consultants value, and as illustrated in chapters, 5,6 and 7 all of which score very highly on the questionnaire results.

Discussion interviews

There were some limitations to these interviews. As with all qualitative research there is the possibility of bias in the recruiting process since all participants were volunteers, and, for instance those supervisors who were particularly happy or unhappy with the RMC might be more likely to volunteer. However, in order to negate this, at least two supervisors (medicine and surgery) from each of the seven Deanery Hospital Trusts with Liverpool graduates were involved in the interviews reported here. Although there were more male supervisors than female supervisors (41 male compared with 13 female) interviewees, this reflected the profile of the

supervisors of the Deanery at the time. Including the 23 pilot interviews which took place in 2001 (Watmough *et al* 2002) approximately 50% of the Mersey Deanery supervisors at the time of data collection were interviewed.

It would perhaps have been preferable to have a more equal balance between physicians and surgeons, but it could not be forecast how many would volunteer to be interviewed or how many interviews it would be possible to arrange with those who did volunteer. When the questionnaires were distributed (see chapter 1) to the educational supervisors a reply slip was included in the covering letter (see appendix C) inviting supervisors to volunteer for an interview. The interviews which took place in 2001 had to be shared between this project and by a project looking at the PRHO year run the Mersey Deanery (Brown 2005). Only this project needed access to the supervisor volunteers during the interviews of 2002 and 2003. Of the 41 supervisors interviewed in 2002, seven supervisors had also taken part in the 2001 interviews. However, in total 21 surgeons from a range of surgical specialties including general surgery, urology, orthopaedics, thoracic, cardiovascular, gynaecology, breast and other oncology specialties were interviewed. A number of the interviewees were from the newer PRHO specialties which tend to be medical rather than surgical. The number of supervisors did ensure that there was a saturation of themes and this made up for the imbalance between physicians and surgeons. As there was such controversy over the issue of basic science knowledge and the reform of the curriculum it was important that as many views on these subjects from as many specialties as possible were gathered.

The 2002 interviewees were remarkably opinionated in their views considering they had only worked with one RMC cohort. As the supervisors had one cohort to work with at the time of these interviews it was though possible that their views might have been skewed somewhat by the small numbers of PRHOs they had seen. Many of the interviewees had worked in the Liverpool area for many years so had seen plenty of graduates from the TMC but had only experienced a few house officers from the RMC. However, the supervisors generally referred to the PRHOs "as a whole" and made very few references to individual house officers, so it appears they had gained a holistic view of the PRHOs as a cohort.

By and large the comments were along the lines of "they have poor pharmacology knowledge", "they" have been good communicators", "their attitudes have been good" and "they" have worked hard." As all supervisors had worked with the "traditional" graduates for many years they already had a mindset about their abilities, which made it easier to differentiate between types of graduates. It was the supervisors who initiated any comparisons that arose suggesting they felt they had seen enough from this one cohort to draw their conclusions. Of course there were various comments such as "well we have only had them for one year..." but supervisors on the whole were happy to give firm opinions about them and make comparisons between TMC and RMC graduates.

The supervisors who were interviewed in 2003 had more experience of RMC graduates, having worked with two cohorts. The supervisors interviewed in both 2002 and 2003 had much more experience of TMC graduates than RMC graduates although both sets of interviewees will have experienced several cohorts of RMC students on

clinical attachments prior to 2002 and 2003. Nevertheless it was important to have gathered the views of those who had worked with two cohorts. It was possible that there could have been differences between those who had worked with one or two cohorts or anomalies in the questionnaire data from the 2nd cohort supervisors that could have been explained by interviews with supervisors who had supervised the 2nd cohort.

There were some other limitations to the interviews, notably the time constraints which limited the amount of topics that could be covered. Generally, supervisors could only spare 30 minutes or so for the interview so it was important to try and stick to the pre-determined topics where possible. Also, as had already been discussed the supervisors had certain points they wanted to raise which were "specialty-specific" either in the undergraduate course or to do with training in the Mersey Deanery area. All comments about training in the Mersey Deanery area have been discarded or comments that were specific to a specific hospital unless they were related to the RMC or the influence of the RMC on the performance of PRHOs.

There was no time during the interviews to discuss some of the areas that were covered on the questionnaire such as "understanding legal and ethical issues" and "coping with uncertainty". Although, as has been discussed in chapter 7, it is possible to tie these in with curriculum reform. As has been covered in chapter 7 and will be discussed in the following pages it is possible to explain the increases in the following questionnaire variables; "how well prepared are the PRHOs you supervise"; "communicating effectively"; "managing time effectively"; and "understanding the relationship with primary care" for example. This is one of the advantages of using mixed methods i.e. that not only can the quantitative data be triangulated and

explained by qualitative but it is also possible to gather information on subjects from the questionnaires that it wouldn't be possible to gain from the interviews alone.

The "basic science" issue was the most controversial issue to come out of these interviews and has been looked at throughout this thesis. As discussed in chapters 5 and 7 the questionnaire variables pertaining to "knowledge" have thrown up variable results regarding knowledge base, with "diagnosis-decision making and the provision of treatment" in particular being "significantly" worse when comparing TMC and RMC supervisors. It was also shown that other variables such as "understanding disease processes" did not show a significant decrease when comparing the supervisors' views of the final TMC cohort and first two RMC cohorts. It has already been discussed in chapter 7 that this could be partly down to a culture of defensive medicine among junior doctors and it has been discussed in chapter 8 that there is often concern over knowledge base when a PBL curriculum is introduced. However, these interviews have shown that there is some concern among the supervisors about basic science knowledge base although no clear picture has emerged on this, as there has, for example over communication skills or how well prepared they felt the RMC graduates were for the role of PRHO.

The supervisors were asked about knowledge in general rather than specifically about the ability to diagnose and understand disease processes. The supervisors were free to give any answer they wanted regarding basic science. The majority of supervisors did feel that the TMC graduates were better than the RMC graduates. However, generally, even those who expressed some concerns about basic science knowledge in some areas felt they were better prepared for the role of PRHOs than TMC graduates.

There is little concrete evidence in the literature about how students synthesise knowledge and convert this into diagnosis skills. There is evidence that PBL students can integrate basic science and clinical knowledge and it has been shown that PBL students (Boshuizen *et al* 1990) can take an analytical approach to a problem and then integrate it with clinical aspects whereas traditional graduates tend towards to a more memory-based approach. These different approaches may offers some explanation as to why the supervisors were unsure about the knowledge base of the RMC graduates. However, another study has shown that students from both traditional and PBL curricula (Patel *et al* 1991) make equally incoherent diagnostic explanations. This study also showed there were differences in the knowledge levels of students and that PBL students did use backward reasoning in applying knowledge which was different to traditional students.

As has already been illustrated in chapters 4 and 8, Colliver (2000) disputes the effectiveness of PBL and believes there is no evidence that PBL students can apply knowledge any better than traditional graduates, and Glew (2003) feels that there is sufficient evidence that PBL curricula do not deliver sufficient basic science knowledge. Albanese (2000) and Norman & Schmidt (2000) would dispute these conclusions but acknowledge much more work needs to be on this area. It has been seen that 3 major studies on PBL (Albanese & Mitchell 1993, Vernon & Blake 1993) (Berkson 1993) are cautiously optimistic about the effectiveness of PBL for gaining professional knowledge and clinical problems solving (Maudsley & Strivens 2000).

The consultants saw the TMC graduates as good at taking a history and examining patients. The majority also felt that the RMC graduates had good skills in these areas

and in fact many had noticed an improvement in history taking skills and this was attributed by many supervisors to the communication skills classes. The TMC and RMC students were taught history and examination skills differently – the TMC students learned these skills on the introduction to medicine and surgical placements whereas the students were introduced to these techniques in the Clinical Skills Resource Centre before seeing patients. However, a minority of supervisors, the ones who expressed most concern about the knowledge base, felt that they couldn't undertake a proper history and examination and were not as well prepared for the PRHO year as TMC graduates in this area. Studies have shown that educational supervisors have concerns over the history and examination skills of PRHOs after graduation so it is encouraging that the overall the RMC graduates were seen as having good examination skills and improved history taking skills (Fox *et al* 2000, Probert *et al* 2003).

The fact that some supervisors expressed concern about postgraduate exams shouldn't perhaps be seen as too surprising. The TMC graduates managed to complete their postgraduate exams successfully whereas the Liverpool RMC graduates were an unknown quantity at the time of data collection beyond PRHO level so perhaps apprehension is natural. The same supervisors who felt the RMC graduates would have real difficulties at postgraduate exams also felt they were least prepared for the role of PRHO and expressed concern over examination skills. At the time of submission there is no data available at the present time whether curriculum reform has impacted on postgraduate exam pass rates and this is part of the rationale for extending this project (cf chapter 11). Supervisors who have "some" worries not "major" worries felt that it "may" take the RMC graduates longer until they are ready

to pass postgraduate exams. Some felt that, although knowledge was "weaker", this wasn't necessarily an issue of concern and the RMC graduates had different skills which would enable them to pass postgraduate exams.

Worries about knowledge levels from senior doctors are nothing new in medical education. In the 1870s the College of Physicians complained about the knowledge of physiology and anatomy at one medical school (Poynter & Law 1966). Flexner (Flexner 1925) in 1925 wrote that the curriculum was overcrowded leading to problems in knowledge retention, and the GMC on many occasions has alluded to this in recommendations on medical education going back to the 1860s (Bullimore 1998, Stacey 1992). These interviews raise wider issues about the content of a medical course, as there is no agreement on whether or how deficient the basic science knowledge is and in which areas. Many felt the TMC graduates were "better" and "knew more" but couldn't quantify exactly how much more they knew. Many consultants had a different angle on this depending on their specialty and the only common ground on knowledge base was that the TMC gave tried to instil "too much" and largely irrelevant knowledge. Many of the supervisors were glad that the science content in the RMC had been reduced; it just seemed that they were "unnerved" by the emphasis of PBL in the RMC for science teaching. Many were concerned with just one science for example, anatomy and pharmacology and some, but not all were specialty related although one general surgeon had concerns over microbiology. As will be demonstrated in the next chapter no GPs had any concern over science knowledge. There is a current debate in medical education about how anatomy should be taught (McLachlan & Patten 2006). Nearly all the supervisors mentioned

that they had had to revise for their postgraduate exams as they had forgotten what they had been taught at undergraduate level.

However, not all supervisors thought the knowledge base of the traditional graduates was of the required standard. Other research (Prince *et al* 2005) has shown that teachers at Dutch medical schools have different expectations of science knowledge depending on the background of those questioned. Many supervisors admitted they had not remembered what they had been taught from their traditional course and they had to work very hard and learn from scratch or relearn sciences for their Royal College exams. As has already been illustrated, one surgeon said

You have to remember not to quiz them like a traditionalist. (S16 2002 S)

It has been shown that the potential aims and advantages of PBL may be lost if students are examined in a manner inconsistent with PBL principles (Kaufman & Mann 1999). A study using the Canadian licensing examinations showed no significant differences between graduates of a traditional and PBL curriculum regarding knowledge base in postgraduate exams (Kaufman & Mann 1998) and a similar study in the United States suggests PBL (Blake *et al* 2000) graduates perform better. Enarson & Cariago-Lo (2001), again by looking at the results of traditional and PBL graduates in the US licensing exam steps 1 and 2, conclude that PBL can provide students with the knowledge needed for subsequent phases of their medical education. Many of the supervisors were unsure about how students gained knowledge due to the assessment in the RMC – which was not what they were used to in the TMC particularly the use of portfolios in the final year. Portfolios do have many advantages and can under the right circumstances encourage self -directed learning (Dressien *et al* 2003, Rees & Sheard 2004). As has already been discussed in

chapter 7 can encourage medical students to gain the skills required to be a doctor. Many supervisors felt that having "traditional" exams at the end of final year benefit the students' knowledge acquisition despite the well documented disadvantages in the traditional way of examining (Radcliff & Leicester 2003).

Some supervisors did feel that the improved learning styles of the RMC graduates would help them when revising for their postgraduate exams. Here there was no unanimity about whether the RMC had engendered these skills, but the majority of supervisors did feel that there was some change in the PRHOs in this area and that they were either better "self-directed learners" or were somehow more inquisitive or questioning. This in itself is significant, especially as it has already been illustrated in chapter 8 that the RMC PRHOs and TMC PRHOs did feel the RMC graduates would be better prepared in this area, although the RMC graduates didn't necessarily think this was a good thing. As has already been looked at in chapters 3 and 8 there is already some debate over whether PBL does engender a change in learning styles or clinical reasoning. Some would argue PBL doesn't engender any improvements (Colliver 2000, Groves 2005) while others say there are some positive changes to learning habits (Dolman & Schmidt 1996, Vernon & Blake 1993). Unlike, say practical skills, supervisors couldn't ask other junior doctors or nurses if their PRHOs had self-directed learning skills. Also they are not assessed as PRHOs on their self directed learning skills as they are on their ability to perform venepuncture for example (on the Mersey Deanery RITA form). It may be that this will only truly reveal itself as the RMC graduates undertake audits and research projects as SHOs and SpRs and begin studying for their postgraduate exams.

Overall, the supervisors felt that the RMC graduates were better prepared for the role of PRHO than TMC graduates and this ties in with the hypothesis of this thesis. Even some supervisors who were concerned about knowledge base said they were much better prepared for the role of PRHO. Only a small number of supervisors believed the RMC PRHOs weren't as good as the TMC graduates. It has been shown in chapter 8 the importance of a shadowing attachment for the PRHOs and the supervisors endorsed this and felt it was the most welcome part of the RMC.

It would be fair to say that only those supervisors with the greatest concern over knowledge base believed that the RMC graduates were less well prepared for the role of PRHO than TMC graduates. Certainly, a small number of the supervisors felt that TMC graduates were well prepared as they only had limited expectations of PRHOs but seeing graduates for RMC had raised their expectations of how well prepared graduates could be to work as PRHOs. This can be correlated with the views of TMC PRHOs who had low expectations of how well prepared it was possible to be for the PRHO year (see chapter 8). As already discussed in chapters 5 and 7 there was an improvement in the "general" question of how well prepared the supervisors felt PRHOs were when comparing the results from the TMC and RMC questionnaires and from these interviews it is possible to explain why this is.

The "shadowing" attachment is undoubtedly very important in preparing graduates to work as PRHOs but for the supervisors, as with the PRHOs it isn't just the "shadowing" that has brought this about improvements in preparedness for the job. The shadowing attachment undoubtedly has an influence on their skills and competencies and PRHOs have the opportunity to see how to ask for help, be aware of limitations, team working, communicating, practical skills, how to order tests and

learning about the routine of the ward amongst other skills. It is unlikely that the 7 week shadow placement alone would have that impact although for the supervisors it is very important. For example, many supervisors see the SAMP placements as very important but they welcomed the introduction of communication skills training, the Clinical Skills Resource Centre and the SSMs as helping to prepare the RMC graduates for the role of PRHO.

The PRHOs were also seen as having good attitudes to working. Although, only a small number made this point, some supervisors did say that TMC graduates seemed "worn down" by the 5th year or PRHO year compared with RMC graduates.

They remain very bright and enthusiastic and receptive when they move from the course, whereas the old style pre-clinical course really ground them into the dust and made them sort of limp. (S1 P 2002)

One surgeon commented how keen RMC graduates were undertaking his surgical rotation, even the ones who had no interest in following a surgical career which he attributed to a change of attitudes in students engendered by curriculum reform. Other studies have also noted that the introduction of PBL into the curriculum can engender more positive attitudes and enjoyment of a medical curriculum than traditional curricula amongst both students and teachers (Albanese 2000, Norman 2004).

The supervisors believed that the RMC PRHOs had better communication skills than TMC graduates which for many supervisors helped ease the transition from student to junior doctor. It has been discussed in chapters 7 and 8 that this can have a beneficial impact on the competencies of junior doctors and even on patient outcomes. The questionnaires showed a significant improvement of the consultants' ratings from

TMC to RMC graduates and they linked this specifically to the communication skills classes in the RMC. Here, the views of supervisors were unanimous and even supervisors who had limited contact with the PRHOs recognised an improvement in them.

The supervisors indicated that the RMC PRHOs were very competent when it came to undertaking practical skills on patients and that not only were they more competent in comparison with recent TMC PRHOs but many supervisors noted that the RMC had more confidence in this area than they did when they were junior doctors. However, although the questionnaires percentages for more than mid point did rise there were no "significant" differences regarding practical skills (see chapters 5 and 7). The supervisors are less likely to complete the clinical skills variables on the questionnaires anyway, and some supervisors admitted in the interviews they were unlikely to actually witness them carrying out some of the less common skills. Other studies (Vallis *et al* 2004) and the supervisor interviews have shown that there is a blurring of boundaries over whether a PRHO or nurse would undertake certain clinical skills and no one really expected their PRHOs to perform ECG, insert a nasogastric tube or suture. The supervisors only expected "basic" skills although some were pleased that some PRHOs could undertake more complex procedures such as lumbar puncture, which isn't on the questionnaire anyway. Also, the skills which received the lowest ratings on the questionnaires are often skills which aren't seen as the most important for house officers today (cf chapter 7). However, supervisors did say that the improvement in skills had eased the transition from student and junior doctor and the supervisors linked this directly to the RMC and specifically the Clinical Skills Resource Centre, which has also been shown to improve clinical skills in Belgium and Dutch medical graduates (Remen *et al* 1999). The supervisors in the

interviews saw the RMC PRHOs as well prepared to undertake practical procedures which other UK schools have their graduates to have little confidence in undertaking (Evans *et al* 2004). All supervisors welcomed the introduction of the Clinical Skills Resource Centre, even those who weren't keen on aspects of the RMC.

The supervisors also felt that the RMC graduates were good team workers, had an excellent understanding of the roles of the other health care professionals and were aware of their limitations and not afraid to ask for help. The questionnaire results also showed that the RMC PRHOs were good at team working and were aware of limitations (cf chapters 5 and 7). Elsewhere in the UK it has been shown that graduates from a PBL curriculum do have a broader view of what constitutes "the team" than traditional graduates (Willis *et al* 2003 b) and this was commented on by a number of Liverpool supervisors. Other studies have shown that non traditional medical graduates rate themselves being better at collaboration with other health care professionals (Hill *et al* 1998). This is particularly important since team working is government policy for the NHS (DOH 2000) and was seen a problem issue in the past (Heenan 1991).

Being aware of limitations and knowing when to ask for help are extremely important aspects of being a junior doctor (GMC 1993, 2002) and the supervisors felt the RMC PRHOs were good in this area although there is very little in the literature about junior doctors skills at being aware of limitations although PRHOs do appreciate working in a supportive environment (Lempp *et al* 2005). Possibly, thanks to recent interest in professionalism in medical education, there has been more focus on the attitudes of medical students (Ajzen 1996, Fishbein & Ajzen 1974) and junior doctors. Whilst

attitudes are hard to measure and are not necessarily an indicator of behaviour (Ginsburg, *et al* 2000) the supervisors were asked in a very general way about how they perceived the attitudes of the PRHOs. If they had such concerns it is likely they would have said so. Generally, curricula with a PBL element have been seen to have produced graduates who have enjoyed their medical education (Norman & Schmidt 2000, Albanese 2000) and more supervisors expressed concerns about working time directives and hospital policies for PRHOs than they did about the attitudes of PRHO, those who did express concerns were in a minority. The impact of this has been discussed in more detail elsewhere (Molloy 2003, Berry 2003, Leinster 2003, DOH 2004) and is a reminder that there are other factors outside the curriculum which impinge on the competencies of junior doctors.

When discussing curriculum reform many consultants said that they don't see the RMC as a "finished product" and that they expect the curriculum to "evolve" or have alterations made which presumably would be aimed at improving the graduates in future years. These comments were very similar to the PRHOs' recommendations to improve the curriculum (see the final conclusion for a further discussion of this). As has been illustrated earlier in this chapter many supervisors were unsure of the exact content of the RMC. One supervisor, very much in favour of the new course, wanted to see better dissemination of the course.

A bit more dissemination of this course and the curriculum would probably be the biggest thing I would be after. I think the concept of the course is excellent and I am very confident that in time with a bit of goodwill on the part of the students and the teachers and really of tolerance and willingness to adapt.. those glitches... ironed out quicker if there is better dissemination. (S6 2002 S)

This may help explain why there was some uncertainty over certain bits of curriculum reform for some supervisors alongside the already documented concerns about knowledge base. It is obvious that the consultants would have a better knowledge of the TMC. A number of supervisors were Liverpool graduates and all interviewees were educated under some kind of traditional course as well and many were actually teachers/lecturers under the old system and have worked in the Liverpool area for years. Not every individual recommendation from every consultant could have been included in this report so just the general or common ones are discussed. Also, all interviewees had a slightly different take on the PRHOs' knowledge so this raises wider issues about the content of a medical course. Taking into account everyone's views would be impossible. The fact that the Liverpool course was so traditional without even a shadow attachment and very little integration and had a huge emphasis on anatomy, for example, may be why there are some opposed to the new course. As reform in Liverpool was very radical particularly over the teaching of the basic sciences may be a contributory factor as to why some supervisors have concerns over knowledge. The TMC in Liverpool did place a huge emphasis on science teaching through lectures and was seen as "very old" and very "traditional" so the change here must have been perceived as being exceptionally radical in some quarters.

Very few supervisors linked curriculum reform in Liverpool to the recommendations from the GMC or changes that had occurred at other universities. For some it was almost as if curriculum reform had happened in isolation and not necessarily because of the all the well-documented reasons for wanting to change medical curricula (GMC 1993, 2002, Walton 1994). It may be that the GMC's role in regulating medical education may not be understood by some consultants. Even though there was a

feeling the RMC could be improved there were different views on how that should happen. Generally, the few interviewees who mentioned the GMC wanted to criticise it as an institution. But the fact that they all wanted slightly different alterations or recommendations suggests there should be an arbiter or umpire over what is included in an undergraduate curriculum such as the GMC. It can be argued that many full time consultants or GPs are too busy to give much thought to curriculum reform which, reinforcing the view that somebody else needs to set the standards for medical education.

Many supervisors welcomed the introduction of PBL, but felt there was perhaps too much with more "structured" teaching needed despite the ambiguities this raises. It was generally agreed there should have been an increase in primary care teaching, but not how much should have been introduced and where in the course it should be. It was recognised that pre-1996 there needed to be a decrease in basic science teaching but not everyone is happy with the way it is taught in the RMC. It might have been difficult for some supervisors to understand fully how PBL works. Prior to the RMC in Liverpool only one other UK medical school used PBL and that was only introduced in 1994 (O'Neill 1998). They would have all experienced a traditional curriculum as students and the Liverpool course was seen as "particularly" traditional.

However, despite the many differences, only a very small number of supervisors disputed the inclusion of elements of PBL in the RMC and only a small number of interviewees felt the traditional curriculum could have carried on indefinitely. The parts of the RMC that have been universally welcomed are unique to the RMC. They weren't part of the traditional course, which wouldn't have been feasible to have

incorporated into the new system without a radical overhaul, especially given how "traditional" the old Liverpool course was. The conundrum is that the supervisors were often enthusiastic about the parts they felt were good in the new curriculum, yet still wanted some of the "old style" within the course. Also, there were only a few supervisors who didn't want the GP component increased but many felt that there was now too much in the course. During interviews held with GPs (Watmough *et al* 2005b) the GPs welcomed the increase in community teaching although they were pragmatic about this increase and did express concerns over remuneration. The GP PRHO supervisors', although much smaller in number seemed to have more of an understanding of the curriculum in Liverpool than consultant colleagues. The supervisors views on improving the RMC are generally similar to those of the PRHOs expressed in chapter 8 and will be looked at again in the main conclusion.

Despite the concerns expressed by some supervisors over knowledge and curriculum reform it has to be stressed there are far more positives than negatives to come out of the interviews. According to the vast majority of supervisors the graduates have worked very well as house officers and handled the transition from student to junior doctor. The fact they could differentiate so readily between RMC and TMC graduates shows curriculum reform can make a difference. The interviewees believed that the attitudes of the PRHOs are very good, they work well as part of a team, they examine and take histories well, their communication skills are good and their practical skills are good. Despite wanting more "structure" and less general practice many supervisors accepted that the curriculum had to be reformed. Although many supervisors expressed concerns about science knowledge the RMC graduates were seen as having enough knowledge to work competently as PRHOs.

This chapter has focused on the hospital consultants' views of the RMC PRHOs and curriculum reform, the following chapter will focus on the views of the GP supervisors.

Chapter Ten. Liverpool PRHOs in General Practice.

The previous chapter summed up the views of the consultant educational supervisors on the competencies of the RMC PRHOs. This chapter focuses on the GP supervisors' views of the competencies of the final RMC cohort and the first two cohorts to graduate from the RMC. The data was collected through a combination of questionnaires and interviews.

As described in chapter 2 the RMC places a different emphasis on primary care compared with the TMC with approximately 30% of the clinical attachments based in the community. In the TMC at Liverpool students only took a 4 week placement in general practice in the 4th year. Despite the Governments' attempts to encourage an increasing number of doctors to move into general practice (DoH 2003), primary care rotations at PRHO level were very limited at the time this data collected. PRHO rotations were available since the 1978 Medical Act (Illing *et al* 1999) but up until 1995 only the London Deanery offered GP rotations (Wilton 1995) and in 2002 only 5% of PRHO rotations in the UK took place in primary care (Illing *et al* 2003). PRHO rotations began in the Mersey Deanery in 2000 – so the final TMC cohort were the first Liverpool graduates able to undertake a GP rotation and stay in the Mersey area. As with other Deaneries throughout the country the numbers in the Mersey Deanery were limited, with PRHO rotations only available at 4 GP practices. This allowed 12 PRHOs per cohort to work a 4-month rotation alongside 4 months hospital medicine and surgery. These GP placements were tied in with the hospital rotations at Warrington, Arrowe Park, Aintree and Whiston. Once primary care rotations were available for Liverpool graduates in the Mersey Deanery GP educational supervisors

were appointed who had the same responsibilities as hospital consultants who supervise PRHOs (see chapters 1, 5 and 9).

Even though there are only small numbers involved, given the amount of community teaching there is in the course and that large numbers of Liverpool graduates will become GPs it is worth looking at the GPs' views on the competencies of Liverpool graduates. Unfortunately it wasn't possible to gather the views of the PRHOs who worked in the general practice as the small numbers involved may have compromised anonymity in the PRHO questionnaire surveys. However, the views of the PRHOs on their attitudes to their undergraduate teaching in general practice have been covered in the focus groups in chapter 8.

Methods

As outlined in chapter 4 two main research methods have been employed; questionnaires (appendix E) were distributed and interviews took place with GP PRHO educational supervisors. The questionnaires were based on the competencies outlined in the "Aims of General Practice training" in *The New Doctor* (1997) and followed the same format as the hospital questionnaires. The GPs were asked to rate the competencies of the Liverpool PRHOs they supervise. As already discussed in chapter 4 there were 5 points on the Likert scale on the questionnaire ranging from "generally very competent" to "generally not very competent" with "generally quite competent" as the mid point. For ease of presentation and discussion the questionnaires have been summarised in three points rather than the 5 points on the Likert Scale. The upper two points on the Likert scale have been banded to together

and labelled as "more than generally quite competent" (more than midpoint), "generally quite competent" (midpoint) and "less than generally quite competent" (less than midpoint). The points for the "general" question ranged from "generally well prepared" to "generally not at all well prepared" with "generally quite well prepared" as the midpoint. The data was analysed on SPSS for windows using the same method as the consultant questionnaires. The questionnaires for all three cohorts were distributed at the same time and with the same covering letter (see appendix) as the ones sent to consultant supervisors.

Questionnaire Results

Response rate (Questionnaires)

2000 cohort 100% (4/4) distributed summer 2001)

2001 cohort 75% (3/4) distributed summer 2002)

2002 cohort 100% (4/4) distributed summer 2003)

The tables on the following pages below show the results in percentage terms of the GP questionnaires for the 2000, 2001 and 2002 cohorts respectively.

Table 27 2000 PRHO cohort

Competence ratings provided by GP educational supervisors of the 2000 cohort (n = 4)

Questionnaire variable	% rating at more than midpoint	% rating at midpoint	% rating at less than midpoint
Ability to take a concise history	50	50	
Carry out relevant examination (physical)	50	50	
Carry out relevant examination (mental)	75	25	
Identify the seriously ill patient requiring hospital care	75	25	
Having good communication and presentational skills	75	25	
Outline a management plan for common acute and chronic conditions	25	50	25
Basic knowledge of practice management	25	50	25
Providing appropriate care for people of different cultures	25	50	25
Good IT skills	50	50	
Out of hours working in primary care	66	33	
Time management skills	25	75	
Understanding the role of the primary care team	25	50	25
Understanding relationship between primary and secondary cared within the health service	25	50	25

Table 28 2001 PRHO cohort

Competence ratings provided by GP educational supervisors of the 2001 cohort (n = 3)

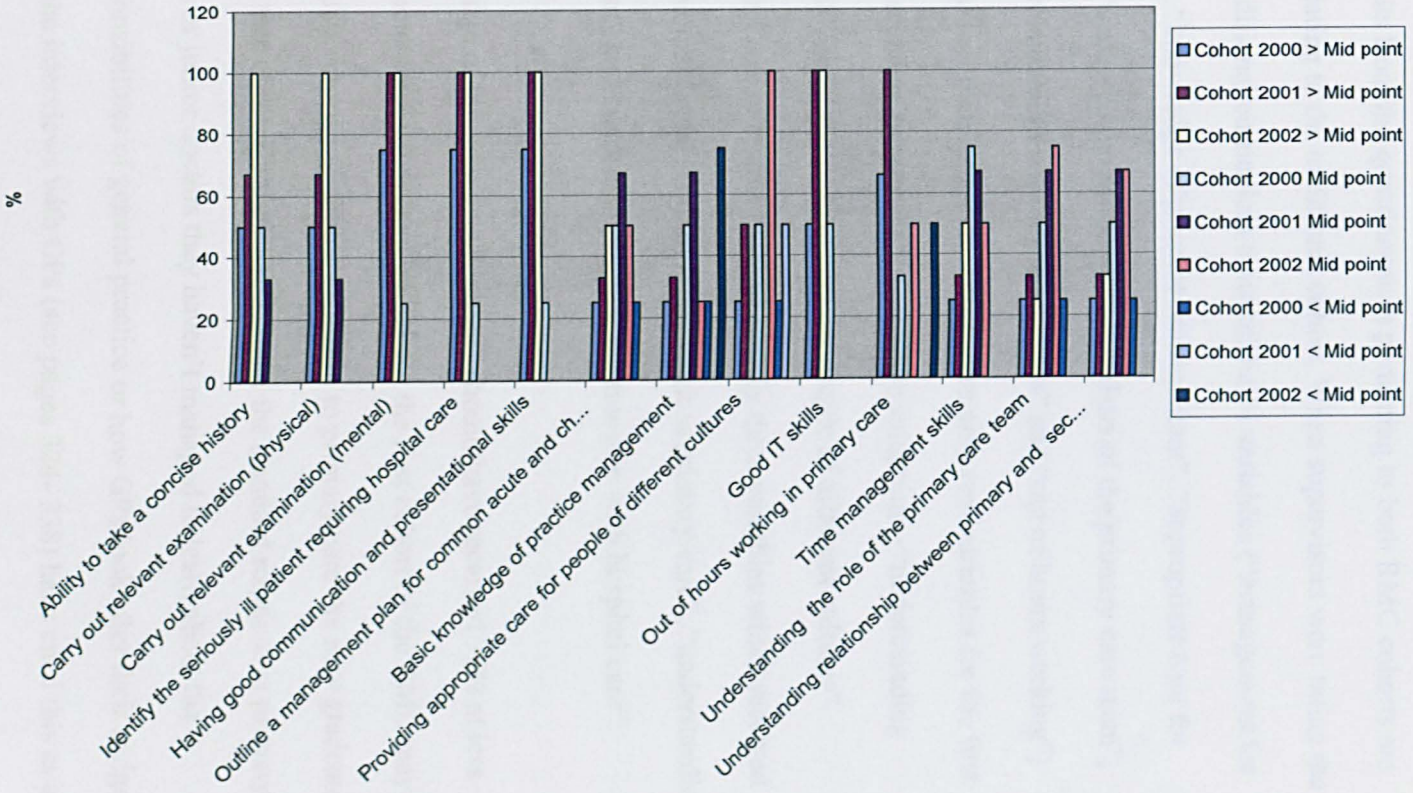
Questionnaire variable	% rating at more than midpoint	% rating at midpoint	% rating at less than midpoint
Ability to take a concise history	67	33	
Carry out relevant examination (physical)	67	33	
Carry out relevant examination (mental)	100		
Identify the seriously ill patient requiring hospital care	100		
Having good communication and presentational skills	100		
Outline a management plan for common acute and chronic conditions	33	67	
Basic knowledge of practice management	33	67	
Providing appropriate care for people of different cultures	50		50
Good IT skills	100		
Out of hours working in primary care	100		
Time management skills	33	67	
Understanding the role of primary care team	33	67	
Understanding relationship between primary and secondary cared within the health service	33	67	

Table 29 2002 PRHO cohort

Competence ratings provided by GP educational supervisors of the 2002 cohort (n = 4)

Questionnaire variable	% rating at more than midpoint	% rating at midpoint	% rating at less than midpoint
Ability to take a concise history	100		
Carry out relevant examination (physical)	100		
Carry out relevant examination (mental)	100		
Identify the seriously ill requiring hospital care	100		
Having good communication and presentational skills	100		
Outline a management plan for common acute and chronic conditions	50	50	
Basic knowledge of practice management		25	75
Providing appropriate care for people of different cultures		100	
Good IT skills	100		
Out of hours working in primary care		50	50
Time management skills	50	50	
Understanding the role of primary care team	25	75	
Understanding relationship between primary and secondary cared within the health service	33	67	

Table 30.Graph demonstrating comparisons between GP questionnaire results



It has not been possible to carry out non-parametric tests on comparisons between the cohorts given the small numbers involved. Nevertheless, it is possible to carry out a basic analysis of the GP questionnaire data and highlight some important issues and themes.

The percentage results from the questionnaires pertaining to both RMC cohorts are higher than those relating to the traditional cohort. When supervisors were rating the last cohort of the traditional curriculum 6 out of the 14 variables ("management for chronic conditions", "knowledge of practice management", "appropriate care for different cultures", "understanding the role of members of the primary care team", "understanding the relationship with secondary care" and "out of hours working") received one score at less than midpoint. There were only two variables for the first RMC cohort which received two marks for less than midpoint – "understanding practice management" and "appropriate care for people of different cultures". Looking at the second cohort results there were only three variables which received only 25% for less than midpoint; "out of hours work in primary care", "understanding practice management" and "understanding the relationship with hospital care".

That "basic knowledge of practice management" should have received 75% at less than midpoint for the second cohort and 66.7% for the first cohort of the RMC may be seen as something of a surprise given the exposure to primary care the new graduates receive. It could be that clinically the PRHOs meet the standard required in primary care but as students or junior doctors they haven't managed to learn about the administrative responsibilities of general practice or how GPs look after their budgets. However, none of the interviews with GPs (see pages 324- 338) have cited this as a

problem for either cohort of the RMC and it could be that this just isn't important for a PRHO or it is something that is learned at a later stage of medical education. Regarding "out of hours work in primary care", this may be partly linked to the limited hours PRHOs have to work nowadays, which has clouded the GPs views of them in this area. Certainly, during the interviews there were no concerns expressed about their attitudes when they were in work.

Perhaps the hardest questionnaire result to explain is that one of the GPs rated their second cohort PRHOs (no supervisors rated the first RMC cohort at less than midpoint for this variable) at less than midpoint on "understanding the relationship between primary and hospital care". As discussed in chapter 9 the consultant supervisors feel the PBL PRHOs are significantly better at understanding that relationship – certainly from a hospital perspective than previous PRHOs. It could be that anomalies in the data are more likely with the GP questionnaires compared with the hospital questionnaires given the small numbers involved. Also, the 2002 cohort were rated at 100% at more than midpoint for "identifying the seriously ill patient requiring hospital care". Another telling statistic that shows the improvement in ratings from TMC to RMC cohorts is that none of the questionnaire variables were rated 100% at more than midpoint for the 2000 cohort, but three variables were rated at 100% for the 2001 cohort and six for the 2002 cohort.

As discussed in chapters 7 and 9 there was some concern over the knowledge level of RMC PRHOs from consultant supervisors. Possibly the closest variable relating to "basic knowledge" on the questionnaire is "outlining a management plan for common acute and common conditions". This received 50% at midpoint and 50% at more than

midpoint from the 2002 cohort supervisors. For the 2001 cohort it was 33.3% at more than midpoint, 66.6% at midpoint and for the 2000 cohort, 25% more than midpoint, 50% midpoint and 25% less than midpoint. So the GP supervisors don't see this as a problem for the RMC graduates.

The first five variables on the questionnaire for the 2002 cohort received 100% for more than midpoint (more than generally quite competent) which is higher than the first cohort from the RMC which in turn were rated higher than the last cohort of the traditional curriculum. These variables are; being "able to take a concise history", "carry out a relevant physical examination", "carry out a relevant examination of mental state", "identify a patient requiring hospital care" and "having good communication skills", "identifying the seriously ill patient requiring hospital treatment" and "communication and presentation skills". It can be argued that all these relate in some way to basic knowledge and that along with "management plan for chronic conditions" are absolutely vital for anyone working in any form of medicine, but are particularly important for a GP. "Using IT skills", also received 100% at more than midpoint for both the 2001 and 2002 cohorts, showing an improvement on 50% for the 2000 cohort, which reflected the hospital supervisors' views that the new course PRHOs are a lot stronger at utilising informatics for medical practice. Overall, the questionnaire results are very positive in favour of the RMC graduates and show a distinct improvement from the 2000 cohort to the 2002 cohort.

Free-text comments on the questionnaires

The final section of the questionnaires for the GPs said: Please add any further comments or suggestions for how well prepared the Liverpool graduates are for their role as a pre-registration house officer (*If a comment relates specifically to either knowledge (k), skills (s) or attitudes (a) – please put the relevant initial (K, S or A in the box alongside that comment).*

2000 cohort questionnaires

Three supervisors made 5 comments on the questionnaires.

One pertained to knowledge*: Low knowledge (at start) on common problems, on community services. Quite a lot of basic science.*

One comment referred to the fact that the PRHOs had good communication skills and another that they had low expectations of a GP placement but had responded well to one-to-one supervision.

There were two more general comments:

Our first PRHO was a revelation: an open page onto write educational activities. The 2nd and 3rd showed signs of confirmation of "protocol thinking!" And took a little time to settle into the complexities of general practice. An enjoyable and rewarding experience for all at the practice.

All the students/PRHOs I have dealt with have been committed, knowledgeable and able to take clinical decisions if they feel confident.

2001 cohort questionnaires

Two questionnaires contained a total of 5 comments.

Three related to knowledge. One said that PRHOs were not comfortable about prescribing and in particular "drug reactions" and cost implications or that they sometimes order "blanket investigations" in order not to miss anything when they could be more specific. The final comment illustrated no concern about knowledge base.

I have been pleasantly surprised at their levels of knowledge – perhaps it is because they know where to go to find the answers!

Another comment said that had excellent communication skills and the final comment related to attitudes:

Again I am heartened at the lack of cynicism or negativity at a time when medicine is trying to adapt to unprecedented expectations and demands.

2002 cohort questionnaires

Two supervisors made three comments.

One was a general point about the small numbers of PRHOs: *PRHOs in GP often feel out of step with colleagues i.e. 4/12 attachments, not 6/12 therefore they change into*

new jobs at different times to their peers but nurses and consultants expectations maybe the same.

One supervisor commented that prescribing was always an issue and that the PRHOs were good at exploring the psychological effects of illness.

The free text comments on the questionnaires were generally favourable about the RMC PRHOs although there were hardly any negative comments on all 3 cohorts of questionnaires. It is notable that two of the supervisors used the comments to note that it took the traditional graduates some time to settle in the post, comments not made to the RMC PRHOs which may be an indication of the extra experience the reformed curriculum graduates had in this area at an undergraduate level. One supervisor did express concerns about the prescribing skills of graduates from the RMC and this was mentioned by the same supervisor during the interviews. It is significant that one of the GPs believed that the graduates had good "Self-directed learning skills" and as will be illustrated in the interview section of this chapter the GP supervisors did feel the PRHOs had the necessary problem solving skills. There were not many negative comments made for any of the three cohorts.

General Practice Supervisor interviews

The interview questions followed the same format as the hospital supervisors but with the emphasis on skills required in primary care. For example they were asked specifically whether the graduates were well prepared to work in primary care, whether they could take a GP-centred history and examination (unlike the hospital supervisors this included a question about psychological examination because of the prevalence of this type of examination in general practice) and about their referral skills in primary care.

How well prepared were the Liverpool graduates from RMC prepared for the PRHO in General Practice overall?

What is their basic science knowledge like?

Do they have good communication skills?

Are they aware of their limitations?

Do they have good interprofessional understanding?

Can they take a good GP centred history, relevant clinical and psychological examination and make appropriate referrals?

What are their attitudes like?

Has there been any change in their learning style as a result of curriculum reform?

What they felt about the old traditional Liverpool course/ did they feel was it time to change the curriculum?

What would they do to improve the course?

The above questions were given to all the supervisors during the interviews. The interviews took place in their offices and generally lasted 30 – 40 minutes. They were basically the same questions that were put to the consultant supervisors. When the questionnaires were distributed to the GPs the covering letter invited them to take part in the process (see appendix C). They were analysed in exactly the same way as the consultant interviews and details of how the interviews were analysed have already been covered in chapters 4 and 9. The coding and thematic framework for the GP interviews is the same as the supervisor interviews and is illustrated in appendix H.

Interviewees

Three sets of interviews took place. In the summer of 2001 2 interviews took place with GPs who had supervised the final cohort of the TMC PRHOs (see chapters 4 and 9 for details). In the summer of 2002 three interviews took place with three of the 4 supervisors who supervised the first cohort of the reformed curriculum. One of those supervisors had already been interviewed in 2001 to gather views of the competencies of traditional graduates. In 2002 he was interviewed about the competencies of the

first cohort of the reformed curriculum (listed as GP 1). In 2003 two more interviews took place with two of the four GPs who supervised the 2nd cohort of Liverpool graduates (GPs 4 and 5). One of these GPs came from the practice who had two supervisors and whose practice partner had been interviewed the previous year. The other supervisors came from a practice which changed supervisors at the beginning of 2002. The previous GP supervisor from this practice had been interviewed about the competencies of the traditional graduates in 2001. Of the 5 GP interviewees included in this thesis 4 had worked with both traditional and RMC PRHOs. Data collection for this thesis was ended in August 2003 every GP who had supervised Liverpool PRHOs in general practice had been interviewed and surveyed by questionnaire.

As with the consultant interviews the pilot interview results are not included here. The GPs, like the hospital supervisors, they were able to refer to the competencies of the RMC graduates when talking about the RMC graduates anyway. The interviews with the supervisors who had worked with traditional graduates showed that overall they were happy with the performance of traditional graduates in General Practice (Watmough *et al* 2002, Watmough *et al* 2003), although as will be illustrated they felt the RMC PRHOs were better prepared to work in primary care. The GPs are numbered 1 – 5. GP 1 was the supervisor who was interviewed twice – both before and after the 1st RMC cohort graduated.

2001 cohort interviews

(Three out of the four supervisors who had worked with the 2001 cohort).

Competencies of the first RMC cohort in General Practice

The three supervisors felt that the PRHOs to graduate from the RMC had performed very well in general practice and that although they thought the TMC graduates had performed well the RMC graduates were better. One GP said that this year one of his house officers had been from a traditional medical course elsewhere in the country and straightaway he could tell the difference between that graduate and the Liverpool graduates.

The PRHO met what the GPs expected of their PRHOs when answering the opening question to the interview; "How well prepared have the graduates been to work as a PRHO in general practice?"

Excellent. They are better prepared for doing the GP stint....(GP3)

I think they are very well prepared when they come into general practice. I think that their clinical knowledge base is very good. I am impressed by how good they are at identifying what they need to know and how good they are at going out and finding it.(GP1)

I think we have been lucky but the doctors we have had have been pretty good, old and new I think and bearing in mind that some of them who come in August haven't done any hospital medicine...I really think they have done very well. (GP2)

The GPs felt that the PRHOs had good history taking and examination skills. The PRHOs were seen as having the ability to undertake this either from the start of their placements and one supervisor in particular was impressed at their ability to interpret the information they receive from patients and act appropriately on the information. It was commented by all GPs that taking a general practice history is different from a hospital history and required different skills. Undertaking a sensitive clinical examination was not seen as a problem for RMC PRHOs. It was also felt the PRHOs dealt adequately with taking a mental health examination, which is a large part of general practice. One GP did point out though that the psychiatric elements in GP consultations are probably one of the hardest things for PRHOs in general practice to cope with. He continued that depressed patients were the most likely patients to complain about a doctor and he had heard of no such complaints. Again, another skill which the GPs noted was more prominent in primary care than in the hospital is the ability to know when to make appropriate referrals and whom the patients should be referred to. Here, the PRHOs were seen as competent at this skill.

Yes, they are very good in terms of referrals in terms of both acute referrals to secondary care and all of them have had the opportunity of arranging an acute referrals, they are aware of referrals within the primary health care team.(GP3)

The other clinical skills of the PRHOs were also rated very highly by the interviewees. The GPs recognised that there was less scope for undertaking practical procedures on patients in general practice than there were in the hospitals. The GPs were asked which practical procedures the PRHOs actually undertook in their practice. One GP said that they undertook little or no practical skills in his practice, as

he would delegate these to the practice nurse. Another GP said that the PRHOs can use ECGs or undertake cervical smears, syringe ears or carry out phlebotomy and there were no problems with any of those skills. All three GPs agreed that the communication skills of the PRHOs were very good and they were very capable when it came to explaining treatments with patients.

I think they are excellent, very good – I think they are much more aware about using communication skills (GP1)

None of the three GPs interviewed had any serious qualms about the knowledge base of the PBL graduates. One GP did say that he had fears after the introduction of a new curriculum in Liverpool but that they haven't been realised when he had worked with the graduates.

There were reservations about PBL and I think one of the biggest revelations was this idea about lack of knowledge, no I have to say our experience with house officers...that hasn't been an big area where they are ignorant or unconfident so it would seem to me an unfounded fear. (GP3)

The GPs did not report any problems with physiology, anatomy and the other basic sciences. The PRHOs were seen as having the ability to integrate knowledge and transfer it from one field to another and understanding disease processes.

I haven't found it in any way obstructive to what they are doing with patients in consultation, er, no, not in any way, I think they are able to examine and I think they are able to identify appropriate muscles, tendons, erm. I have not had any evidence that has been difficult. (GP3) One GP did express a concern over prescribing (see free text comments as well) which he saw a concern with GP registrars as well and

another GP about dermatology knowledge of Liverpool graduates from both the TMC and RMC. One GP said when asked to comment on what some hospital supervisors have to say about knowledge deficiency replied

well that is from pure prejudice quite frankly. If anything when I have discussed it with a house officer here, my concern was that they didn't know where the boundary was to stop.(GP1)

This GP was concerned that the students had an appetite to acquire knowledge beyond what they actually needed. The only real criticism about knowledge came from one GP who mentioned that students and PRHOs were weak on pharmacology in relation to their costs and use and that this could be improved.

Tied in with the GPs' lack of concern about basic science knowledge was that they felt the PBL curriculum had fostered self-directed learners or at least graduates with "better" learning skills or improved learning styles. One said it was one of the few differences between TMC and RMC graduates.

Of the 3 this year, I would say they are a little bit more willing to problem solve (GP3). Another gave an answer that contrasted Liverpool graduates with a traditional course graduate who had been at his practice that year.

Our first PRHO was a guy who had undergone a traditional course and the next were problem based Liverpool people and they were significantly different in their problem solving skills, much, better, much, much more further on so to speak.(GP1)

One supervisor even said how he let his trainees fill their own RITA form in before he looked at as he felt they were more capable of evaluating their performances.

The attitudes of the Liverpool graduates were seen as very good. The only reported problem came from a graduate from another medical school. The PRHOs were seen

as very "disciplined" and hard working and one interviewee said that this could be down to the fact *that the old course tended to beat out some of the more human attitudes from the students.* (GP2)

It was also reported that the students had not just good attitudes towards all the other staff in the surgery, both admin and the other health care professionals. It seems they also have a good understanding of the roles of the other health care professionals within the primary care system.

I think the new course is giving a very good understanding of the PAMs roles, the students seem very aware by of that by the 4th and 5th year so the housemen seem very aware of it. (GP3)

One of the most important areas for any junior doctor is being aware of their limitations and again, here the interviewees showed no concern about the RMC PRHOs about this.

Views on the RMC

They GPs welcomed the change in the curriculum at Liverpool and thought the traditional course was very dated and curriculum change was very necessary.

I think it was long overdue for reform.... I think it is very artificial not seeing patients until we were in our 3rd year and I think it was very much learning by memorising information really.(GP3).

I think the old curriculum was founded on the basis of cram with facts, which you learn for exams and then dump after that. I am not saying it produced unsafe doctors, I think it was just an inefficient vehicle for producing doctors. (GP 2)

The supervisors related back to their own education when giving their views on curriculum change. One GP mentioned that at Newcastle 30 years ago he was taught under an integrated course and that

The Liverpool curriculum was absolutely dinosaur.(GP1)

There was also a feeling that a PBL course is an "appropriate" learning tool. Of course all the interviewees were happy that there is a lot more community in the new course and remembered the "token" few weeks they had as undergraduates. One GP said she hoped the PRHOs would take a more "humane" approach to patients from primary care when they go back into the hospitals and that in the undergraduate course, *exposure to the community offers an enormous amount of pathology.... And see how we deal with real people with real problems with diseases.*(GP2)
Also, learning in primary care can break the "artificial" divide between doctors in the community and doctors in hospital.

The interviews concluded with a request for the GPs to offer any recommendations they feel may improve the curriculum. One GP said he would like to see improved dermatology teaching in the course. Although not a university matter, this GP felt that greater funding for PRHOs and students in general practice was needed to ensure a high standard of teaching. The second GP said that more information needs to be given from faculty and that

Teachers need to know the totality of the course....I mean we knew what went on in the old course. (GP2)

The final GP said she couldn't think of anything and concluded that the PRHOs were a credit to the course.

Interviews 2002 cohort

(Two GPs who had worked with the first two cohorts of reformed curriculum and one who had also worked with the final cohort of the traditional curriculum).

Views on first two cohorts of RMC

Both GPs felt that the Liverpool graduates had been well prepared to work as house officers in general practice.

I think on the whole they have done very well – we think so at this practice. (GP5)

The GP who had supervised traditional and RMC graduates said that both sets of graduates had been well prepared as PRHOs but he did notice that the communication skills were much better in the RMC PRHOs. In fact both GPs identified the communication skills of the PRHOs as a particular strength. This was linked specifically to the communication skills classes in the course. Neither GP had any concerns about the PRHOs having to break bad to patients or their families.

I think out of the ones that have been here I wouldn't have any hesitation that they do that when the circumstances arose. (GP5)

Also, tied in with their communication skills was their ability to elicit a specific general practice-based history. Again, there were no problems in this area and they could take a precise and relevant general practice history.

They are good at... social histories, family history, things like that which add up to the picture we want in general practice.(GP4)

After the PRHOs had taken the history their examination skills were also seen as being of a similarly high standard.

Yes they have been pretty good at going through the (examination) procedure that we would have expected from the old course, so I have no problems at all.(GP4)

The GPs felt there wasn't much opportunity for PRHOs to undertake practical procedures under their supervision.

They probably do venepuncture, if they wanted, we don't particularly do any major procedures... so they don't get a lot of exposure as somewhere a bit more rural. (GP5)

However, the few skills they were called on to perform they were able to carry out and in this area were seen as more competent than the traditional course graduates.

When we started when you get up in the middle of the night to put the first venflon in and you know you would put 15 holes in before you actually hit a vein. Erm, they have all done that kind of stuff. They can all take blood, they can all put venflons in – that kind of thing. (GP4)

The mental health aspect of primary care was highlighted by one GP who said that *in three quarters of the consultations in general practice there is a psychological element to it.*(GP4)

Both the supervisors felt that the PRHOs were particularly strong in the area of consulting with patients with mental health problems.

I think they are pretty good at getting all the factors we might ask for in a mental state examination. They actually see a lot, for example of major depressions such as with brand new patients. (GP4)

When necessary the PRHOs could also make the appropriate referrals to hospitals, although both GPs agreed that this took a little bit of time for any junior doctor to get used to no matter how they were educated. The GPs also saw the PRHOs as good team workers who understood the roles of the other health care professionals within primary care and were adept at working closely with other team members.

Yes, they fit in very well, it just means we have a lot more leaving do's! (GP4)

The PRHOs were seen as being "properly" aware of their limitations in a positive way.

They are willing to identify where they have problems and address those problems. I think that is a good point as well. (GP5)

In fact there were no reported deficits in their ability to perform as junior doctors in primary care and the PRHOs were seen as possessing good attitudes towards patients and other members of staff they had worked with.

One of the GPs interviewed said that he had noticed no problem with their basic science knowledge saying

I think their knowledge is fine.... They have a good understanding of disease processes and I can tell this through their history taking and by the way they present patients to me (GP5).

The other interviewee felt that they did have "less grounding" in physiology and anatomy than traditional graduates and there might be isolated problems if they came

up against a patient with a ruptured plantarus tendon, for example. He felt the traditional graduates would have known about that. He then went to say that many of things he learned as an undergraduate such as the Kreb cycle he had long since forgotten. The supervisor didn't feel there would be any problems with the graduates' long term over basic science knowledge and in fact had a Liverpool PBL graduate at his practice who sat the RCP part one whilst working as a PRHO and passed it first time.

When asked whether they could understand disease processes this supervisor said: *I think they are just as well equipped and I think for those sorts of things they are at least as well equipped and probably better able to problem solve to start with.* (GP4) Again, as with the interviews which took place with the three supervisors who had worked the first cohort from the RMC, both these GPs felt that the PHROs had good problem-solving skills and that was very useful in general practice. These problem-solving skills also allayed any long term concerns over knowledge base.

Views on curriculum reform

The GPs felt the traditional curriculum was very didactic and overdue for reform. *A lot of the stuff I learned, I learned for exams and forgot about, certainly on the first and second year and that obviously couldn't be right, the amount of factual knowledge you retained for a limited time..... I had forgotten the important things and the unimportant things...*(GP5)

I think the traditional course needed to be changed because it propagated a set of values that perhaps weren't as PC as it were. (GP4)

Introducing PBL was welcomed as a positive development.

I think on a practical basis it is what everybody does. (GP4)

That isn't to say the GPs thought that nothing could be improved in the course. Although both interviewees welcomed PBL in the course and the end of the TMC they had some minor "issues" over the PBL. One of the supervisors felt that the PBL worked better with the students later on in the course, for example it worked better with, say third years compared with first years. Another slight concern for one GP was that they may "miss bits" because of it, but then conceded that this kind of thing happened under the old curriculum anyway.

The small number of recommendations the GPs had to improve the course also reflects their overall lack of concern about the new curriculum. One GP suggested a small number of didactic sessions alongside the PBL, possibly in pharmacology. The other GP commented that if they (the GPs) were with 2nd year students it was sometimes difficult to make sure they saw (what he felt) was a "prescriptive" list from the University such as showing the student a small family, or if the GP wanted to talk to the students about a patient with hepatitis B, the student would be likely to say that they don't cover that until the third year. One GP would like more dissemination about the content of the course. But other than that there were few complaints about the course. Whilst neither were particularly "evangelical" about the amount of primary care (one GP accepted how difficult it would have been to increase community teaching in the traditional course as it stood) that there needs to be in a medical curriculum they did feel there were benefits to the increased exposure to primary care in the new course.

I am not a great campaigner for students being particularly taught in general practice, but I think we can give them some basic that maybe is not available in the hospitals due to time constraints. I am not saying we can teach surgeons to be surgeons, but I certainly think we can have some input into making a generic doctor which I think is what we are supposed to do at medical schools. (GP5)

Discussion GP results

Tomorrow's Doctors recommended that community teaching in undergraduate medical curricula should be increased and stressed that the community was an under-utilised resource in undergraduate medical education. This reflected international moves towards community-based undergraduate medical education (Anon 1994, Whitehouse *et al* 1997). The University of Liverpool increased community undergraduate medical education in line with these recommendations, not just to teach students about general practice but also to learn generic medical skills such as dealing with the social and emotional factors in illness, obstetrics, paediatrics, psychiatry and communication skills in what has been described as clinical teaching in general practice, if not about general practice (Worley & Lines 1999). At the time of data collection it would be hard to tell how much of the generic medical knowledge the students will have learned in undergraduate general practice will prove useful later in their careers. One study has shown that students can acquire clinical skills as well, if not better, in general practice as they can in the hospital with examination skills in particular benefiting (Murray *et al* 1997). Another study has demonstrated that PRHOs in general practice gain educational benefits in communication skills, social and psychological factors in illness, patient centred consultations, broadening of

knowledge base and help with uncertainty over diagnosis and referral (Illing *et al* 2003). Certainly it is possible to say that that the increase in undergraduate General Practice teaching in Liverpool has improved their PRHOs' skills in general practice from the evidence presented in this chapter.

The RMC PRHOs in the focus groups (see chapter 8), whilst complaining about the amount of community teaching did feel the skills they learned in primary care were applicable in hospital medicine and surgery. The TMC graduates offered no opinions on their undergraduate medical education in primary care which is very telling in its own right. Also, whilst many of the hospital supervisors did think that there was too much community teaching in the RMC they did recognise that it had to be increased when the new curriculum was introduced.

The work undertaken with the GP supervisors has shown that they were very satisfied with the PRHOs from the RMC. Research has shown that rotations in General practice as this level are beneficial to the PRHOs (Illing *et al* 1999). The GPs had thoroughly enjoyed working with the PRHOs. Indeed, it has been shown elsewhere that it can be rewarding for both the PRHOs and the GPs (Illing *et al* 1999, Illing 2003, Wilton 1995,Williams *et al* 2001). GPs have also benefited from having students as it keeps their skills sharpened and practices up to date (Hampshire 1998). As has been discussed in chapters 5, 7 and 9 the hospital supervisors felt that graduates from the reformed medical curriculum had a better understanding of the relationship between primary and hospital care. The PRHOs from the RMC also articulated this in the focus groups.

The supervisors who had worked with the final cohort of the traditional curriculum felt that these PRHOs were of the standard expected (Watmough *et al* 2002). The questionnaire results also showed that the supervisors felt these PRHOs were competent at the required skills. They felt that the traditional graduates had performed well in general practice and as the traditional cohort were the first PRHOs that the GP supervisors had seen and it is probably fair to say they had no bench mark to guide them. Whereas the hospital supervisors had been working with PRHOs for many years this was a new experience for the GPs. Supervisors interviewed after working with the RMC PRHOs said that the traditional graduates had been good but the PBL graduates were better. This was also reflected in the questionnaire results which improved for each of the three cohorts surveyed. It could be argued they would be in a better position to assess both TMC and RMC PRHOs after working with both kinds of graduate. What did come across in the interviews in particular was that they felt the standard had been raised by the RMC graduates.

There were coherent themes to emerge from the data. The strengths of RMC graduates are clear from these interviews. The PRHOs are seen as being able to take a good mental health examination which may not be as prevalent for hospital PRHOs. The GPs also felt they could differentiate between taking a hospital-based history and primary care history. The PRHOs have good communication skills, can carry out the practical skills they are expected to undertake, are aware of limitations, work well in a team, have the required referral skills and have good attitudes to their work and patients. They also see the PRHOs as being better problem-solvers than traditional graduate and as having the required basic science knowledge base and understanding of disease processes. The questionnaires results and interviews corroborate each other

in this respect. For example the questionnaire results looking at the reformed curriculum show the PRHOs as being strong at carrying out physical and mental examinations, communication and presentation skills, identifying the seriously ill patient requiring hospital care, understanding the role of the primary care team. All points that were made in the interviews. There was also corroboration between the variables on the GP questionnaire and their equivalent variables on the consultant questionnaires such as, "communication and presentation skills", , "understanding the role of the primary care team", "good IT skills", and "time management skills". Although the consultants ranked the PRHOs generally lower on "diagnosis and decision making" the GPs didn't rate the PRHOs in general practice lower on "identifying the seriously ill patient requiring hospital" and "outline plan for chronic conditions", arguably the two closest GP questionnaire variables to that hospital variable.

There are some similarities with the hospital supervisors despite the imbalance in numbers between the two groups. Both the questionnaire results and interviews with the hospital and GP supervisors see the RMC PRHOs in general as being good team workers, have good attitudes, good history taking and examination skills, good practical and communication skills. Both consultants and GPs see the PRHOs from the RMC as better prepared for the role of PRHO than TMC graduates. The GPs are more likely to see the PRHOs as better problems solvers than hospital supervisors, which could be a reflection of nature of general practice compared with some hospital specialties although as has been discussed in chapter 9 many hospital supervisors did notice an improvement in this area when comparing PRHOs.

They are also less likely than the hospital supervisors to have any concerns about basic science knowledge base. This may be because GPs have different expectations of the level of science knowledge that is needed at this stage of a PRHO's medical education. The GPs reported no concerns about diagnostic skills either. The consultant supervisors largely welcomed the introduction of a new curriculum in 1996 and the innovations such as the Clinical skills Resource Centre and communications skills classes for example. The GPs also welcomed these developments although the GPs appeared more enthusiastic overall for curriculum reform. Interestingly, although they naturally welcomed the increase in community teaching they appeared more enthusiastic about PBL itself than consultant supervisors. The GPs, unlike many of the hospital supervisors, made the link between "better" problem solving skills and the need to teach "less" science to undergraduates. During the interviews some GPs voiced worries about the effect that having students and PRHOs has on the practice in terms of time and remuneration. These concerns have been mirrored in other studies (Williams *et al* 2001, Parry & Greenfield 2001). Modernising Medical Careers (Department of Health 2004) should see an expansion in junior doctor rotations in general practice, so it may be possible to expand on this work in the future.

As reported in chapter 8 the RMC PRHOs did feel that the amount of community teaching in their curriculum may put some off taking a career in general practice. Only one of the GP interviewees thought it was a possible consequence of increasing the amount of community teaching so the majority didn't feel it would have a negative effect. The literature shows mixed evidence in this area with some papers showing that undergraduate community education can encourage students to go into general practice (Howe & Ives 2001), others that it may have a negative impact

(Goldacre *et al* 2004) . There is still a need to recruit more GPs in the UK (DoH 2000, 2003) and it is important to know what effect the curriculum will have longer term on the career choice of Liverpool graduates. As will be looked at in the conclusion to this thesis the School of Medical Education is running an extension to this project which will look at the longer term impact of curriculum reform in Liverpool. One of the areas of this project will be to look at the longer term impact of the increase in community teaching on career choice.

There are of course limitations to this chapter – and the key concern must be made regarding the numbers small numbers involved in both the interviews and the questionnaires. The GP questionnaires and interviews are subject to the same potential biases and limitations that have been highlighted in both chapters 7 and 9 regarding the consultant questionnaires and interviews. Given the amount of community teaching in the RMC it is arguably better to research the views of the small number of GP supervisors were rather than omit them from the study. Each GP, who up until the summer of 2003 had worked with Liverpool PRHOs had expressed their opinion through both questionnaires and interviews. These GPs, as well as being involved in supervising PRHOs, have had GP registrars and students at their surgeries so have a good all round perspective on educational matters relating to General Practice. The hypothesis for this thesis is that RMC will produce better prepared PRHOs. Overall the GPs were happy with the content of the RMC and that it is producing competent PRHOs who are well prepared to work in General Practice.

This chapter has summarised the view of the GP supervisors on the competencies of the RMC graduates and their view on curriculum reform and is the final chapter

summarising the data collected in this thesis. The next chapter will offer an overall conclusion to this thesis and describe the project which is being undertaken to answer the outstanding questions which have been raised by the results.

Chapter. 11 Conclusion.

This final chapter summarises the key themes which have run through this thesis, offers an overall conclusion to the findings and highlights the project which is being undertaken at the time of submission to evaluate the impact of curriculum reform beyond the PRHO year and into post-registration training.

The hypothesis tested in this study was that the RMC PRHOs would be better prepared for the actual role than previous graduates. The overriding conclusion must be that the PRHOs from the RMC have been very well prepared for the role of PRHO. The evidence suggests they are better prepared for the actual role than previous graduates and the hypothesis of this thesis was that RMC PRHOs would be better prepared for working as house officers. As has been illustrated throughout this thesis, it can be argued that some of this improvement can probably be attributed to the introduction of the RMC. This isn't to say there weren't some concerns in the data that was collected, for example about basic science knowledge levels of the RMC PRHOs. There have also been concerns about the limitations of the methodology used. These limitations have been covered throughout the thesis, which are briefly re-visited here.

Perhaps the most obvious limitation is that there is an overall imbalance between data collected on the TMC and RMC PRHOs since more data was collected on the RMC graduates. For example, there were 9 focus groups held with RMC graduates and only 4 held with TMC graduates. Also, two cohorts' worth of questionnaire information were collected on PRHOs and their supervisors and only one cohort of TMC PRHOs

and their supervisors received questionnaires. However, it is arguably better to have gathered some data on the TMC graduates than have none at all and this data collected from the TMC graduates has helped put some perspective on the results on the first two cohorts to graduate from the RMC. This has also allowed a comparison of TMC and RMC graduates.

Some background work for this study was completed prior to registration for this degree and has been published separately (Watmough *et al* 2002, Watmough *et al* 2006 a, b). Questionnaires were distributed to the penultimate cohort of the TMC and their supervisors. Although these were analysed by SW, the data was collected prior to the data collection for this thesis so they are not formally included. As these results have been published they have been alluded to in the questionnaire chapters and they are a useful addition to the data collected on the TMC graduates and do help redress the balance in the data collected between RMC and TMC graduates. Also, this work demonstrated that it would be possible to recruit PRHOs and supervisors into this study.

Although interviews were undertaken with supervisors before the first RMC cohort had graduated only interviews held after the first RMC cohort had graduated have been included in this thesis. As noted in chapter 9 a decision was taken not to include these interviews as the supervisors who had worked with two RMC cohorts were able to compare TMC and RMC graduates and give detailed views on curriculum reform in Liverpool. Therefore supervisors' views on the competencies of the TMC graduates were already included. A large part of those supervisor interviews in 2001 just prior to the first RMC cohort graduating were spent speculating about the competencies of the

RMC graduates (Watmough *et al* 2002). This was probably inevitable as they knew they had just worked with the final TMC graduates.

Similarly, as discussed in chapter ten there were only a very small number of GP supervisors who has supervised both TMC and RMC Liverpool graduates. However, rather than omit the views of the GPs from the study altogether it was felt important to include them given the emphasis on community teaching in the RMC.

The results included here are only the perceptions of competencies in that they are not tested "scientifically". In other words when the PRHOs completed the questionnaires or answered questions about their competencies in the focus groups they weren't actually completing the tasks on the questionnaire and may have at that time carried out some of the tasks only once. As discussed in chapter 7 the educational supervisors may not have seen the PRHOs undertaking the tasks and certainly weren't witnessing them performing the skills when they were completing the questionnaires or discussing their competencies in the interviews. However, the results reflect the perceptions of the people who should be best able to judge the competencies of PRHOs.

Despite the inevitable biases in the views of PRHOs and educational supervisors on the perceptions there is also balance in the data collection. There is balance in the fact that the data collected has used three different methods, questionnaires, focus groups and interviews. This has been discussed further in chapters 3 and 4, but the fact that there was quantitative questionnaire data and qualitative data from focus groups, interviews and the free text sections has allowed the data from one set of results to

explain and reinforce/reiterate the results of the different research methods. Also, the multi-method approach to data collection has allowed a fuller picture of the competencies of PRHOs. For example there wasn't time to ask about everything a PRHO does in the focus groups and interviews. Using questionnaires based on GMC expectations (GMC 1997) ensured that everything the GMC expects PRHOs to be able to carry out was covered in data collection. The advantages of multiple methods and their role in validation and triangulating has already been discussed in more detail in chapters 3 and 4.

Another possible weakness to this thesis is that it has just given an "overview" of results. It would be possible to dedicate a full thesis to some of the issues raised such as the required basic science knowledge level for students, communication skills, clinical skills teaching, the use of portfolios in undergraduate medical education, the content of an undergraduate curriculum, the use of SSMs, the role of PBL in developing learning skills, supervisor's views of the GMC and curriculum reform. However, The hypothesis was that the RMC will produce graduates better prepared for the role of PRHO and the data clearly shows that this aim has been met. There are different aspects of the role of a PRHO such as being able to communicate well, being good team workers, carrying out clinical skills, clerking patients, knowing when to ask for help, having good learning skills and all the other required competencies so it was important to at least cover all the important aspects of the job of a PRHO and tie these different competencies with the teaching in both types of Liverpool curricula. The aims of this thesis could not be met by concentrating individually on any one of those issues.

Another potential weakness could be that the climate around medical education has changed since the work was undertaken for this thesis. The two GMC documents *Tomorrow's Doctors* (GMC 1993) and *The New Doctor* (1997) have been the most influential documents in the data collected in this thesis. During data collection an updated version of *Tomorrow's Doctors* (GMC 2002) was introduced and after data collection was completed an updated version of *The New Doctor* (GMC 2005) was also introduced. However, the principles in these updated versions are very much the same as they are in the original documents. The newer versions of *Tomorrow's Doctors* and *The New Doctor* basically reinforce the values stipulated in the first two documents. The most prominent change, perhaps, has been the introduction of Modernising Medical Careers (DOH 2004) and the introduction of the Foundation programme which offers an extended version of the PRHO year described in this thesis. Although PRHOs are now known as F1 doctors their responsibilities are still the same and they will only be provisionally registered with the GMC until they become F2 doctors after a year of working as an F1. So although postgraduate training has been reformed, the responsibilities of junior doctors have remained the same.

There has been a considerable interest in the results of this thesis. At present 6 papers (Watmough *et al* 2005 a, Watmough *et al* 2006 a,b,c,d,e) have been accepted for publication in peer reviewed journals and over 20 presentations have taken place at conferences and local and national meetings (appendices I and J). The two papers published in *Medical Education* were also included as short papers in *Clinical Teacher* and highlighted as papers that were of real interest to medical educators. The presentations from this work include two presentations to the GMC, one to the

national association of associate postgraduate Deans and presentations to local hospitals, the Mersey Deanery and national and international medical education conferences (Watmough *et al* 2005 b). The work has been published in different journals deliberately to give wider access to the results and not just those specialising in medical education. The presentations have reached academics in medical education, teachers, local doctors and health care professionals, teachers, administrators and researchers from other disciplines who often attend medical education conferences. Reports have also been distributed to all departments in the Faculty of Medicine; the GMC; and all the hospitals in the Mersey Deanery area.

There are also certain strengths about the data collection. As has been illustrated in depth in chapter 3 the work is grounded in the general programme evaluation literature and the medical education evaluation literature by drawing on examples of other medical schools, both in the UK and internationally who have evaluated their curriculum or sections of their curriculum. Therefore the data collection hasn't taken place in isolation. The fact that there are mixed methods reduces the chance of bias overall and the fact that the views of both PRHOs and their supervisors, both in the hospital and community were gathered gives a balanced view. Both PRHOs and supervisors both have a strong, deeply personal interest in how well an undergraduate medical curriculum prepares its graduates to work in the NHS. The roles of PRHOs and supervisors have been covered in more detail in chapter one.

Several common themes run through the data from both the supervisor and PRHO results which offer further validity to the findings and give credence to using mixed methods. Perhaps the clearest example of this is with the communication skills. Both

RMC and TMC graduates rated themselves as very strong at this in the questionnaires. The focus groups showed that they had different reasons for believing they were good communicators. The supervisor questionnaires showed that there was a significant difference in communication skills in favour of the RMC graduates. During the interviews they gave examples of how the PRHOs had improved as communicators and that they felt it was because of the communications skills teaching in the RMC.

Also, the fact that the views on the content of the RMC itself were gathered from educational supervisors and the PRHOs gives a balance as they give the views of teachers and students. The standards for curriculum reform and the competencies of the PRHOs have come from the GMC, not simply from within the University of Liverpool so the results can be seen in a national context not just from the point of view of The University of Liverpool. *Tomorrow*'s *Doctors* was aimed at all UK medical schools and as the Liverpool curriculum was based on these recommendations which were universal for all UK medical schools this work has a wider relevance. In fact the GMC itself, before this thesis was submitted (GMC 2006) has called for institutions to evaluate the impact of *Tomorrow's Doctors.*

The only controversial aspect to come out of this research for this thesis has been that of basic science knowledge. As has already been discussed, different supervisors saw different areas of perceived weakness in the RMC graduates. Some supervisors thought the PRHOs' knowledge was good in some areas, but lacking in others, some didn't think the knowledge of the TMC graduates was good enough and the history and examination skills of the RMC graduates were seen as being of the correct

standard. The only consensus from this study on knowledge base is that the old system gave tried to instil "too much" and largely irrelevant knowledge – the TMC graduates admitted this despite feeling they had a good basic science understanding, as did many of their supervisors. There was no agreement on how "deficient" the knowledge level actually is in the RMC PRHOs (see chapters 8 and 9 for more details).

The basic science knowledge issue in RMC graduates has been rightly been highlighted in this thesis as it was a major emerging theme which came out of the qualitative data in particular. To balance this view the qualitative data also showed that there was little concern about the basic science knowledge of the PRHOs while they were working as PRHOs. The concerns were all about whether the RMC PRHOs would struggle after the PRHO year taking their postgraduate exams which is beyond the remit of this thesis. However, not only were these concerns quite prominent there was a decrease in the variables for "understanding disease processes" and "diagnosis, decision making and the provision of treatment" in some of the questionnaire results. Therefore it was important that this issue was discussed. It should be remembered though that these variables were still over 50% for more than midpoint or "at least generally quite competent" and above from both RMC PRHOs and their supervisors and that other variables relating to "knowledge" showed an increase but given the fact the knowledge issue was such a major part of the focus groups and interviews it had to be discussed even if it hadn't impacted on PRHO performance.

The TMC PRHOs and the supervisors who expressed most concern about science knowledge did feel that the RMC PRHOs were better prepared for the role of PRHO

than TMC graduates and had the science knowledge to perform at that level. In fact one of the aims of *Tomorrow's Doctors* was to reduce the amount of science teaching and direct graduates to learn what they needed to know at each of their career which has been covered in greater detail in chapters 7, 8 and 9. However, this thesis is also about gathering views on the content of the RMC, and some supervisors and both RMC and TMC graduates did feel, because of curriculum reform, the RMC graduates may be at a disadvantage further in their careers so, it needed to be discussed in detail. Whereas the "knowledge issue" was due to the reformed curriculum, so were the improvements in competencies according to the supervisors. It could be that uncertainty over knowledge base may be the price paid for reducing the factual burden and improving preparedness for professional practice (Watmough *et al* 2006 e).The recommendations of the PRHOs and consultant supervisors to improve the curriculum at Liverpool have already been included in chapters 8 and 9 and it can be seen that their views were very similar. The most popular suggestion was to have more "direction" or "guidelines" to guide the acquisition of basic science teaching and this could take the form of more "timetabled" tutorials in the Human Anatomy Resource Centre or lectures or plenary sessions alongside the PBL scenarios. None of the RMC PRHOs or their supervisors would have got rid of PBL altogether, but both would have preferred more "structure" alongside it. Importantly, both the RMC graduates and the educational supervisors did see a role for PBL within the curriculum and PBL was recognised as having improved the "learning" and literature searching skills of the RMC graduates – even the TMC graduates recognised this.

A number of the PRHOs and supervisors would have liked more formal assessment procedures in the RMC and a number of consultant supervisors in particular would

have liked final exams at the end of 5th year. The portfolio received criticism from both PRHOs and supervisors although the final year itself (and therefore it can be argued the portfolio) was seen as beneficial in preparing students to work as PRHOs. It may be that they didn't appreciate that the portfolio allows the students to concentrate on acquiring the skills they will need as PRHOs. Other projects within the School of Medical Education at the time of submission are evaluating the undergraduate portfolio in more detail (Fewtrell 2007) and how it works in conjunction with the portfolios in other years of the course which were only introduced after 2002. Current final year medical students at Liverpool will be much more used to using portfolios than the cohorts in this thesis which may impact on how they view them. The TMC graduates would have liked fewer lectures, despite them feeling this had given them a good science knowledge base, and instead of some of those lectures, access to the Clinical Skills Resource Centre and the shadowing attachment. It has already been discussed in depth in chapter 8 that there were differences between the outlook of TMC and RMC graduates to medical education as a result of their different undergraduate education but they both agreed that there should be more "structure" for science teaching in the RMC.

The RMC graduates, and their hospital supervisors, felt there was too much community teaching in the RMC and generally there was a consensus that one way to improve the course would be to cut the amount of primary care teaching in the RMC. The TMC graduates had absolutely no opinion about their 4 week undergraduate attachment in primary care whereas the RMC graduates had plenty of comments about it their teaching in primary care. However, whilst the supervisors and RMC PRHOS would like a reduction in the amount of community teaching they could agree

that it was right to increase the amount of time from the TMC. The PRHOs felt there were some advantages to their GP teaching such as the opportunity to practise communication skills and they did learn skills in the community which they could use as hospital PRHOs. Also, both the PRHOs and their supervisors showed in the questionnaires, interviews and focus groups that RMC graduates do have a better understanding of the relationship between primary and hospital care.

The GP supervisors had fewer suggestions than their consultant colleagues about what they would change about the curriculum. Although fewer in number they didn't have any concerns about the basic science knowledge teaching in the RMC and significantly, they felt the RMC PRHOs had the required knowledge for the stage of training that they were at. The GPs were also very positive about curriculum reform, PBL and the competencies of the PRHOs from the RMC. Apart from their lack of concern about PBL itself and science knowledge their views on the competencies of the RMC graduates were very similar to the supervisors in both the questionnaire results and the interviews (cf chapter 10). They also welcomed the increase in GP exposure in the RMC and whilst this may not be surprising they were not particularly "evangelical" about this and did temper their enthusiasm with concerns about whether GPs could cope with the increase in student numbers in the longer term.

It is worth noting that since the Liverpool course was introduced in 1996 some modifications have taken place to the outline of the course illustrated in chapter 2. A section of the virtual learning environment (VITAL) allows students to post their learning objectives at the end of each scenario. In this way the students can see what other groups are doing and have confidence in their own ability to work within the

process. The PBL scenarios are constantly being re-written to improve the triggers which allow the students to identify learning objectives. A review of the objectives for the SSMs has taken place. The second year has been re-timetabled to allow students to undergo medical and surgical placements on the wards nearer to classes in the clinical skills laboratory and an exam has been introduced at the end of the second year to cut down on the gap between the exam at the end of the first year and one in the middle of the third year. The third year has been completely altered to ensure an exam at the end of years both 2 & 3 to allow clearer progression of students and to incorporate a series of specialist rotations in the third year, emphasising pharmacology and neurology.

The OSCEs in the 4th year have been supplemented with the traditional method of using patients with random clinical conditions (Liverpool Objective Clinical Assessment System) for exams thus integrating what is best from the OSCEs (reliable and consistent) with what was appreciated from the traditional exams (high face validity). It may be worth commissioning further research to evaluate these changes. However, it has to be reiterated that the principles over the curriculum when this thesis was submitted are overall very similar to when the RMC was first introduced. As this thesis is a very "general" overview of competencies of PRHOs and gathered views on curriculum reform these further changes don't alter the relevance of the findings in this thesis. It is worth noting that some of the changes tie in with the recommendations of both PRHOs and their supervisors in the focus groups and interviews.

As has been illustrated above, throughout this thesis there are some outstanding issues which have arisen from the data collection for this thesis. As a result a further project

is underway to answer some of these questions. In early 2005 it was decided to extend the evaluation project to look at the impact of the medical curriculum on graduates about 5/6 years after graduation. This point was chosen as by this stage the graduates will have chosen their career path, yet it is close enough to their time as undergraduates for them assess the relevance of their education. The work involves collecting data on the three cohorts who have taken part in the data collection for this thesis and the penultimate cohort from the TMC.

One of the aims of extending the evaluation project has been to look at the effect that the undergraduate medical curriculum has had on their knowledge, skills and attitudes to work as GPs and in the hospital specialties after the PRHO year. It has been established in this thesis that the Liverpool RMC graduates probably have different skills compared with previous house officers and it is important to see how this has manifested itself later in their careers. As illustrated, the RMC uses different clinical placements for undergraduates compared with the traditional curriculum and has a much higher amount of clinical exposure in the community. Also, students now select approximately 25% of their undergraduate placements. It has already been shown that there are differences between medical schools in career choice graduates (Goldacre *et al* 2004), this project will aim to explore how far the Liverpool curriculum based on *Tomorrows Doctors* has influenced its former students over career choice.

When the work in thesis was undertaken it was not possible to identify what influences undergraduate curricula had on the career choice of graduates as the PRHOs wouldn't have made definite decisions about career path at that stage. Five years after graduation medical students will have had to have made career choices

which wouldn't have been apparent at the PRHO year. This project will examine whether the introduction of community-based medical education has impacted on graduates deciding on a career in the community which is important as some PRHOs did feel they had had too much GP as undergraduates and the TMC graduates offered no opinion about the community at all. Also by that stage the graduates will have undertaken postgraduate exams and had experience of more independence so it will be possible to assess whether there are real concerns over the science teaching whether the clinical skills and communication skills are relevant after the PRHO year and the relevance of the "learning skills".

In May 2005 this proposal to extend the evaluation project to cover the objectives mentioned above was reviewed by the Liverpool Paediatric Research Ethics Committee. Ethical approval was granted on June 7th 2005 (05/Q1502/18). During 2006 data was collected on the final two cohorts of the traditional curriculum 5/6 years after graduation through questionnaires and interviews. The project was reviewed internally by the School of Medical Education and given support by the Head of School and the methods were independently reviewed and approved by the research committee of the Mersey Deanery.

The work in progress at the time of submission of this thesis is as follows. Consent is sought from the graduates as stipulated by the ethical guidelines and all Liverpool graduates from the relevant cohorts will be sent an information sheet and covering letter asking if they would like to take part in the project. A questionnaire, unique to Liverpool but drawing on the literature highlighted in the section above, has been developed along with a framework for interviewing the graduates. The questionnaires

ask the participants to assess the influence of their undergraduate medical curriculum on career choice, on their present competencies as a doctor, how useful their undergraduate career was in preparing them for postgraduate exams and about any teaching or research they have undertaken since graduation. The interviews will be used to gain an insight into the data arising from the questionnaires and triangulate the information. Data has been collected on the final two cohorts of the traditional curriculum over the period of a year, but two years will be needed to collect data on the first two cohorts to graduate from the RMC and to allow full analysis and dissemination of results. The former graduates can be tracked down by gathering their contact address through the GMC database – a method that has been validated by other research projects (Mahoney *et al* 2004) and the Liverpool ethics committee. This method has been used successfully to contact the graduates from the final two cohorts of the traditional curriculum and the first cohort of the RMC. At the time of submission two papers had been presented as ASME and AMEE conferences (Watmough *et al* 2006 f, Watmough *et al* 2007 a) and one paper published in *Medical Teacher* (Watmough *et al* 2007 b).

My reflections

Overall, I have thoroughly enjoyed collecting and analysing the data for all stages of this project. That isn't to say there haven't been some worrying moments. At the beginning I wasn't sure whether I could recruit enough PRHOs and supervisors. There was always an element of risk, for example that PRHOs would refuse to take part in focus groups when they found out the nature of the research. Similarly there was

always a risk that the questionnaire response rates would be too low to merit publication or inclusion in the thesis.

Looking back it can be seen as a risk to have an inexperienced researcher gathering views on a curriculum that had only recently introduced. As alluded to in chapter 9, it was known that there were many supervisors who were against the RMC on principle and it did feel like I was going into the "lions den" when I did the first series of interviews. Also, I felt that not being a clinician may have gone against me when conducting the focus groups as there may have been some lack of respect amongst junior doctors for a non-clinician undertaking this kind of research. After getting over the initial nerves of undertaking the interviews and focus groups these fears were found to be largely groundless and even the people who had didn't like the RMC were usually very courteous and helpful.

Coming from a non medical background I had a steep learning curve ascertaining exactly what a PRHO did prior to data collection and how this was related to their undergraduate training. Prior to data collection I "shadowed" a PRHO for a day and talked extensively doctors and health care professionals in the Faculty of Medicine. Similarly, I had to understand what the role of the GP and consultant was in supervising PRHOs and how surgeons, physicians and GPs may differ in their expectations of what a PRHO should do. The pilot study enabled me to familiarise myself with the language of medicine and medical education.

However in many ways, despite being employed by a Faculty of Medicine who had just introduced a new curriculum the fact I had no pre conceived ideas about either

traditional or reformed curricula proved to be advantageous. I believe that helped me, particularly with the interviews with the supervisors, where I could say I had no axe to grind about a TMC or RMC despite my being employed by the Faculty of Medicine. By the end of the data collection I personally believed that curriculum reform was needed and that if I had a choice as a student I would have preferred to have studied under the RMC. When I started data collection I had no pre conceived ideas about which curriculum would have suited me.

Final Conclusion

There is little doubt from the data collected for this thesis that curriculum reform has had a positive impact on the competencies of the RMC graduates and the way they have performed as house officers. However, it needs to be reiterated that all the evidence suggests that the PRHOs have been very well prepared to work as PRHOs and seemed to have to have made the transition from student to junior doctor with no real problems.

Now the TMC has been replaced there is no clamour to return to the traditional system and many parts of the course are seen as very valuable and positive introductions. Specifically this includes; the shadowing, the clinical skills laboratory with the breaking of the clinical/pre-clinical divide, the communications skills classes, the A & E attachment, the SAMPs and the SSMs. The fact there is PBL within the course and the reduction of lectures is welcomed. Although some PRHOs and supervisors feel there is too much community teaching in the RMC the fact it has been increased compared with the TMC is also appreciated.

The RMC involved a radical overhaul, but it reflected the changes in the NHS, changes in patients' expectations, improvements in educational research, the need to reduce the factual burden on students, improve communication skills and the other recommendations laid out by the GMC. The NHS and Universities are under constant change and have had to cope with a rapid increase in students and the alteration in postgraduate training due to the introduction in the UK of Modernising Medical Careers (Department of Health 2004). These are bound to have a big impact. All changes impact on the content of the undergraduate curricula. Whilst it is encouraging that many consultants recognised the curriculum needed to change, perhaps there needs to be a process which allows them to engage fully in the changes, both locally in the University and nationally with the GMC so any misunderstandings about why the course changed and its exact content can be understood.

Generally, the questionnaire data showed that the PRHOs were at least "generally quite competent" on the skills and competencies listed on the questionnaires. Also, as was illustrated in the opening section of this report the PRHOs are seen as significantly better on the "general" question of how well prepared they were for the PRHO year. The qualitative data is even more affirmative that the RMC graduates are better prepared for the PRHO year. By their own judgement and through the judgment of their supervisors the RMC PRHOs are better prepared for the role of PRHO than previously. Importantly, their communication and practical skills are viewed as improved compared with traditional graduates. There is also evidence that may have acquired "better" learning skills and certainly more questioning than before and good at literature searching. They are also seen as good at understanding evidence-based medicine, taking good histories, utilising IT, recognising the social and emotional

factors in illness, have good attitudes, recognise the relationship between primary and secondary care, worked well in a team, have good interprofessional understanding, and are aware of limitations.

The data indicates that the RMC at Liverpool produces house officers who are better able to cope with the demands placed on them and although this would be sufficient justification for the change, as a leading PBL researcher put it: *Even if the knowledge acquisition and clinical skills are not improved by PBL, enhancing the work environment for students and faculty in itself a worthwhile goal* (Albanese 2000).

Appendices

Appendix A

Evaluation of the University of Liverpool University Medical Curriculum

Educational Supervisors

Name of Educational Supervisor .....

Location: Teaching Hospital ☐ DGH ☐ Other ☐

Number of PRHO's (Liverpool Graduates) I supervise .....

The following list is based on 'The Aims of General Clinical Training' as outlined by the GMC (The New Doctor, 1997).

	Very		Quite		Not at all
general, how well prepared for their role as a pre-registration house officer are Liverpool graduates that you supervise?	☐	☐	☐	☐	☐

ase rate the Liverpool pre-registration house officers their competence in the following: *you feel unable to comment on a specific item then leave it blank).*	Generally very competent		Generally quite competent		Generally not at all competent
Communicating effectively	☐	☐	☐	☐	☐
Working in a team	☐	☐	☐	☐	☐
Being aware of their limitations	☐	☐	☐	☐	☐
Understanding disease processes	☐	☐	☐	☐	☐
Managing time effectively	☐	☐	☐	☐	☐
Developing appropriate attitudes towards personal health and well-being	☐	☐	☐	☐	☐
Recognising of the social and emotional factors in illness and treatment	☐	☐	☐	☐	☐
Providing appropriate care for people of different cultures	☐	☐	☐	☐	☐
Coping with uncertainty	☐	☐	☐	☐	☐
Making the best use of laboratory and other diagnostic services	☐	☐	☐	☐	☐
Using informatics as a tool in medical practice	☐	☐	☐	☐	☐
Understanding the purpose and practice of audit, peer review and appraisal	☐	☐	☐	☐	☐
derstanding the relationship between primary and social care and hospital care	☐	☐	☐	☐	☐
Using opportunities for disease prevention and health promotion	☐	☐	☐	☐	☐
Being aware of legal and ethical issues	☐	☐	☐	☐	☐
Understanding the principles of evidence-based medicine	☐	☐	☐	☐	☐
iagnosis, decision making and the provision of treatment including prescribing	☐	☐	☐	☐	☐

	Generally very competent		Generally quite competent		Generally not at all competent
Keeping accurate records	☐	☐	☐	☐	☐
Obtaining valid consent	☐	☐	☐	☐	☐
Calculating accurate drug dosages	☐	☐	☐	☐	☐
Writing a prescription	☐	☐	☐	☐	☐
Venepuncture	☐	☐	☐	☐	☐
Arterial blood sampling	☐	☐	☐	☐	☐
Suturing	☐	☐	☐	☐	☐
Performing an ECG	☐	☐	☐	☐	☐
Basic CPR	☐	☐	☐	☐	☐
Administering oxygen therapy safely	☐	☐	☐	☐	☐
Correctly using a nebuliser	☐	☐	☐	☐	☐
Inserting a nasogastric tube	☐	☐	☐	☐	☐
Urinary catheterisation	☐	☐	☐	☐	☐
Control of haemorrhage	☐	☐	☐	☐	☐

Please add any further comments or suggestions in relation to how well prepared the Liverpool graduates are for their role as a pre-registration house officer:

(If a comment relates specifically to either Knowledge (K), Skills (S) or Attitudes (A) – please put the relevant initial (K, S or A) in the box alongside that comment)

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Thank you for taking the time to complete this questionnaire.

Appendix B

Evaluation of the University of Liverpool Medical Curriculum

Pre-registration House Officers

PRHO Number: .....

Location: Teaching Hospital ☐ DGH ☐ Other ☐

.....

The following list is based on 'The Aims of General Clinical Training' as outlined by the GMC (The New Doctor, 1997).

	Very		Quite		Not at all
In general, how well-prepared for your role as a pre-registration house officer do you feel?	☐	☐	☐	☐	☐

Please rate yourself on your competence in the following: *(If you feel unable to comment on a specific item then leave it blank).*	Generally very competent		Generally quite competent		Generally not at all competent
Communicating effectively	☐	☐	☐	☐	☐
Working in a team	☐	☐	☐	☐	☐
Being aware of your limitations	☐	☐	☐	☐	☐
Understanding disease processes	☐	☐	☐	☐	☐
Managing time effectively	☐	☐	☐	☐	☐
Developing appropriate attitudes towards personal health and well-being	☐	☐	☐	☐	☐
Recognition of the social and emotional factors in illness and treatment	☐	☐	☐	☐	☐
Providing appropriate care for people of different cultures	☐	☐	☐	☐	☐
Coping with uncertainty	☐	☐	☐	☐	☐
Making the best use of laboratory and other diagnostic services	☐	☐	☐	☐	☐
Using informatics as a tool in medical practice	☐	☐	☐	☐	☐
Understanding the purpose and practice of audit, peer review and appraisal	☐	☐	☐	☐	☐
Understanding the relationship between primary and social care and hospital care	☐	☐	☐	☐	☐
Using opportunities for disease prevention and health promotion	☐	☐	☐	☐	☐
Being aware of legal and ethical issues	☐	☐	☐	☐	☐
Understanding the principles of evidence-based medicine	☐	☐	☐	☐	☐
Diagnosis, decision making and the provision of treatment including prescribing	☐	☐	☐	☐	☐
	Generally very		Generally quite		Generally not at all

	competent		competent		competent
Keeping accurate records	☐	☐	☐	☐	☐
Obtaining valid consent	☐	☐	☐	☐	☐
Calculating accurate drug dosages	☐	☐	☐	☐	☐
Writing a prescription	☐	☐	☐	☐	☐
Venepuncture	☐	☐	☐	☐	☐
Arterial blood sampling	☐	☐	☐	☐	☐
Suturing	☐	☐	☐	☐	☐
Performing an ECG	☐	☐	☐	☐	☐
Basic CPR	☐	☐	☐	☐	☐
Administering oxygen therapy safely	☐	☐	☐	☐	☐
Correctly using a nebuliser	☐	☐	☐	☐	☐
Inserting a nasogastric tube	☐	☐	☐	☐	☐
Urinary catheterisation	☐	☐	☐	☐	☐
Control of haemorrhage	☐	☐	☐	☐	☐

Please add any further comments or suggestions in relation to how well prepared you feel you are for your role as a pre-registration house officer:

(If a comment relates specifically to either Knowledge (K), Skills (S) or Attitudes (A) – please put the relevant initial (K, S or A) in the box alongside that comment)

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Thank you for taking the time to complete this questionnaire.

Please return it in the envelope provided

Appendix C

Initial letter to supervisors

May 2002

Dear Colleague

We would be grateful if you could spare a few minutes to complete the enclosed questionnaire which asks you to think specifically about the competencies of your Liverpool PRHOs at the time they started with you.

This is an important survey as it provides a baseline for evaluation of the New Medical Curriculum and will play a role in developing the curriculum for future cohorts of Liverpool students. We would also like to invite to take part in a short interview with our project officer, Simon Watmough over the next couple of months to ascertain your opinion on the competencies of the Liverpool PRHOs and your views on the new curriculum. We envisage the interview would last no longer than 20 minutes and would take place at your convenience in June or July. If you are willing to take part please complete the reply slip at the bottom of this letter.

We can assure you that the completed questionnaire and interviews will be treated in the strictest confidence. Please return your completed questionnaire in the envelope provided by Friday 14th June.

Thank you very much for your rime,

Yours sincerely

Professor Anne Garden
Director of Medical Studies

Dr David Graham
Postgraduate Dean

I will/will not be able to take part in a short interview (delete as appropriate)

Name.....Location.....

Email.....Telephone.....

Appendix D

Initial letters to PRHOs

February 2002

Dear PRHOs,

We would be grateful if you could spare a few minutes to complete the enclosed questionnaire. The questionnaire has two sections to it. The first questionnaire has two sections to it. The first is a Mersey Deanery questionnaire focusing on teaching and learning experiences as a PRHO. The second part of the questionnaire should only be completed by Liverpool graduates only and asks you think specifically about your competencies at the time you started your PRHO year.

This is an important survey as it provides a base line for evaluation of the new Medical Curriculum, will play a role in developing the curriculum for future students and develop training for PRHOs in the pre-registration year.

We can assure you that the completed questionnaires will be treated in the strictest confidence.

Please return your completed questionnaire in the stamped addressed envelope provided by Thursday 28th March 2002

Thank you very much for your time.

Yours sincerely

Professor Anne Garden
Director of Medical Studies

Dr David Graham
Postgraduate Dean

Appendix E

GP questionnaire

Evaluation of the University of Liverpool Medical Curriculum

Pre-registration House Officers

The following list is based on 'The Aims of General Practice Training' as outlined by the GMC (The New Doctor, 1997).

	Very		Quite		Not at all
In general, how well prepared for your role as a pre-registration house officer in general practice do you feel?	☐	☐	☐	☐	☐

Please rate yourself on your competence in the following: ***(If you feel unable to comment on a specific item then leave it blank).***	Generally very competent		Generally quite competent		Generally not at all competent
Ability to take a concise history	☐	☐	☐	☐	☐
Carry out a relevant physical examination	☐	☐	☐	☐	☐
Carry out relevant examination of mental state	☐	☐	☐	☐	☐
Identify the seriously ill patient requiring hospital care	☐	☐	☐	☐	☐
Having good communication and presentational skills	☐	☐	☐	☐	☐
Outline a management plan for common acute and chronic conditions	☐	☐	☐	☐	☐
Basic knowledge of practice management	☐	☐	☐	☐	☐
Providing appropriate care for people of different cultures	☐	☐	☐	☐	☐
Good IT skills	☐	☐	☐	☐	☐
Out of hours working in primary care	☐	☐	☐	☐	☐
Time management skills	☐	☐	☐	☐	☐
Understanding the role of members of the primary care team	☐	☐	☐	☐	☐
Understanding the relationship between primary and secondary care within the health service	☐	☐	☐	☐	☐

Please add any further comments or suggestions in relation to how well-prepared you feel you are for your role as a pre-registration house officer:

(If a comment relates specifically to either Knowledge (K), Skills (S) or Attitudes (A) – please put the relevant initial (K, S or A) in the box alongside that comment)

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Thank you for taking the time to complete this questionnaire.

Appendix F

Table F shows the associations between codes focus groups and framework for the analysis of the focus groups

Main code/framework	Associated codes/ emerging themes
How well prepared were you for the PRHO year?	Knowledge of the role of PRHO
	Clinical skills
	Communication skills
	Knowledge
	Shadowing
Knowledge base	Anatomy
	Physiology
	Biochemistry
	Pathology
	Other sciences
	Understanding disease processes
	History and examination
	Knowledge overall to work as PRHOs
	Knowledge base for postgraduate exams
	PBL
	Treat and clerk patients
Communication skills	Ability to communicate with patients
	Being comfortable breaking bad news
	Were communication skills classes necessary
Practical/clinical skills	Ability to carry our practical procedures on patients
	How the curriculum encouraged the development of these skills
	Clinical skills resource centre
	Shadowing
History and examination skills *	Ability to take a concise history
	Ability to undertake a relevant examination
Interprofessional understanding	
General practice *	Usefulness in preparation for skills as doctor
	Possible influence on career choice
	Standard of teaching
	Amount of GP in the reformed curriculum
Learning skills	Role of PBL and special study modules
	Comparison TMC and RMC
Views on their own curriculum whether traditional or reformed	Strengths and weakness of their course
	How their course could be improved
	Views on RMC from point of view of TMC graduates
	Views on PBL from both TMC and RMC graduates
	SSMs
Attitudes to their curriculum	RMC and TMC graduates
Assessment	Portfolios
	Knowledge base
	Exams

As has already been discussed in chapter 8 not every one of these codes/areas were covered in the particularly for the TMC focus groups.
NB some of the codes/associations were answered or at least covered in the opening questions

Appendix G

Table G shows the associations between codes for the interviews and framework for the analysis of the consultant supervisor interviews.

Main code/framework	Associated codes/ emerging themes
How well prepared the were the graduates you supervise for the PRHO year ?	Knowledge of their role of PRHO
	Clinical skills
	Communication skills
	Knowledge
	Shadowing
	Comparison with TMC graduates
Knowledge base	Anatomy
	physiology
	Biochemistry
	Pathology
	Other sciences
	Understanding disease processes
	History and examination
	Knowledge overall to work as PRHOs
	Knowledge base for postgraduate exams
	Treat and clerk patients
Communication skills	Ability to communicate with patients
	Being comfortable breaking bad news
	Were the communication skills classes necessary
Practical/clinical skills	Ability to carry our practical procedures on patients
	How the curriculum encouraged the development of these skills
	Clinical skills resource centre
	Shadowing
History and examination skills	Taking a relevant history
	Undertaking a competent examination
Interprofessional understanding	Understanding the roles of the other health care Professionals
	Work well in a team
General practice	Standard of teaching
	Amount of GP placements in the course
	Concerns about general practice
Learning skills	Influence of PBL and special study modules
	Lack of ability of traditional graduates
Views on curriculum reform	Was curriculum reform needed?
	Content of the reformed curriculum
	Views on PBL itself
	Their recommendations to improve the curriculum
	Views on good bits of TMC
	Role of GMC
Attitudes	Link to curriculum reform
	Whilst working on the wards
	Factors outside the curriculum (such as EU directives
Assessment	Portfolio
	Benefits of final exams
	Link to knowledge base
Most important skills for a PRHO from questionnaire	

Appendix H

Table H shows the associations between codes for the interviews and framework for the analysis of the GP interviews.

Main code/framework	Associated codes/ emerging themes
How well prepared the graduates you supervise for the PRHO year?	Knowledge of their role of PRHO
	Clinical skills
	Communication skills
	Knowledge
	Comparison with TMC graduates
Knowledge base	Anatomy
	physiology
	Biochemistry
	Pathology
	Other sciences
	Understanding disease processes
	History and examination
	Knowledge overall to work as PRHOs
	Knowledge base for postgraduate exams
	Treat and clerk patients
Communication skills	Ability to communicate with patients
	Being comfortable breaking bad news
	Were the communication skills classes necessary
Practical/clinical skills	Ability to carry our practical procedures on patients
	How the curriculum encouraged the development of these skills
	Clinical skills resource centre
GP History and examination skills	Taking a relevant GP history
	Undertaking a competent mental examination
	Undertaking a competent physical examination
	Referrals
Interprofessional understanding	Understanding the roles of the other health care Professionals
	Working in a team
General practice	Amount of GP placements in the course
Learning skills	Influence of PBL and special study modules
	Lack of ability of traditional graduates
Views on curriculum reform	Was curriculum reform needed?
	Content of the reformed curriculum
	Views on PBL itself
	Their recommendations to improve the curriculum
Attitudes	Attitudes when working
Assessment	Portfolios
Being aware of limitations	

Appendix I Peer reviewed publications in order of publication date

Perceptions of PRHOs and their supervisors to the introduction of undergraduate problem-based learning and community-based education in the Mersey region

Simon Watmough, John Howard (Mersey Deanery), David Taylor.

Education for Primary Care, **16**, 324-326.

In 1996 the University of Liverpool reformed its medical curriculum from a traditional lecture-based course to an integrated problem-based learning (PBL) curriculum[1,2]. In line with the recommendations in *Tomorrow's Doctors*[3] there has been a major increase in community teaching. About 30% of the clinical placements are now in the community, starting in the second year and culminating in an eight-week attachment in the final year

Despite attempts by the government to encourage an increasing number of doctors to move into general practice[4] only 5% of house officer rotations are in primary care[5]. Such rotations began in Mersey Deanery in 2000. There have been 12 PRHOs per cohort with six GPs supervising them. As part of the evaluation of the new undergraduate curriculum we wished to ascertain the views and perceived competencies of the PRHOs when rated by GP PRHO supervisors and the PRHOs themselves. The views of these doctors may be useful to those currently constructing Foundation programmes.

We sent questionnaires based on 13 competencies specified in 'The aims of general practice training'[6] to the Mersey Deanery GP PRHO supervisors. Competency ratings were marked on a five point Likert scale. All six GPs who have supervised Mersey PRHOs were interviewed between 2001 and 2003. Information was also available from interviews undertaken with consultant supervisors as part of another study. We also formed focus groups with PRHOs to gather their views on the content of the new curriculum.

The questionnaires showed that, overall, the PRHOs are at least 'generally quite competent' in the skills listed on the questionnaires, being particularly strong at:

- Being able to take a concise history
- Carrying out a relevant examination of mental state
- Identifying the patient requiring hospital care
- Having good communication skills

The results were the same for both questionnaires and interviews. The GPs were very positive about the Liverpool PRHOs' assessed skills. They saw the graduates as having good communication skills, being able to make appropriate referrals, being able to take a relevant general practice history and being good at dealing with patients suffering from depression. They were also good at defining a management plan for common and acute conditions. Although there was limited scope for undertaking practical procedures on patients, the PRHOs could carry out what was expected of them. The GPs felt that the PRHOs had the required basic science knowledge and understanding of disease processes.

The GPs who had worked with one cohort of the traditional graduates felt they had performed well but the PBL graduates scored better. Some of the GPs interviewed felt that the new course was producing graduates who were 'problem solvers' which all the interviewees felt was particularly relevant when working in general practice. They welcomed the reform of the undergraduate curriculum, the introduction of PBL and, not surprisingly, the increased exposure undergraduate students now receive in primary care. However none of the GPs was particularly 'evangelical' about community teaching and one GP did express concern that 'too much too soon' may put students off a career in general practice. While the GPs welcomed the introduction of PRHO posts, concerns were raised, as in other studies[7,8], that remuneration for PRHO posts may not reflect the time and costs involved.

The focus groups showed that the PRHOs had mixed views on their undergraduate experience of general practice. Although they recognised that the amount of general practice had to increase with the new curriculum, many of them felt there was too much community teaching and that the new course was almost 'forcing' them to become GPs. The standard of teaching was seen as being more variable than in hospitals. Negative views on community-based curricula and uncertainty about the values of community training have been reported elsewhere[9,10]. The effect of these curricula on career choices remains to be seen.

More positively the PRHOs understood the relationship between primary and secondary care in the NHS and said that some of the undergraduate placements were a useful preparation for working as PRHO. They also felt that the community

placements were a good place to practise communication skills and they enjoyed the one-one interactions with patients.

As in other studies[5,7,11,12], the GPs had enjoyed working with the PRHOs and felt they had benefited from their four months in their surgeries. Both the questionnaires and interviews show that the GPs think highly of the competencies of the PRHOs and perceive those taught in the new curriculum as able problem solvers – a key aim of a PBL curriculum.

This study inevitably involves small numbers due to the small numbers of PRHO posts in primary care. This view from Liverpool shows many positives about curriculum reform and PRHO posts in general practice alongside concerns about numbers of available posts, remuneration for practices and future recruitment to general practice. These concerns will need to be addressed if the Foundation programmes are to be a success.

References

1 Bligh J (1995) Identifying the core curriculum: the Liverpool approach. *Medical Teacher* **17**: 383-390.

2 Bradley and Bligh (1999) One year's experience with a clinical skills resource centre. *Medical Education* **33**:114-120.

3 General Medical Council (1993) *Tomorrow's Doctors. Recommendations on Undergraduate Medical Education.* GMC: London.

4 Department of Health (2004) *Medical Schools: Delivering the Doctors of the Future.* HMSO: London.

5 Illing J *et al* (2003) Pre-registration house officers in general practice: review of evidence. *British Medical Journal* **326**: 1019-1022.

6 General Medical Council (1997) *The New Doctor.* GMC: London.

7 Williams C, Cantillon P, Cochrane M (2001) Pre-registration house officers in general practice: the views of GP trainers. *Family Practice* **18**: 619-621.

8 Parry J and Greenfield S (2001) Community based teaching: Killing the goose that laid the golden egg. *Medical Education* **35**: 722-3.

9 Rosenthal F and Ogden F (1998) Changes in medical education: the beliefs of medical students. *Medical Education* **32**:127-32.

10 Howe A and Ives G (2001) Does community-based experience alter career preference? New evidence from a prospective longitudinal cohort study of undergraduate medical students. *Medical Education* **35**: 391-397.

11 Wilton J (1995) Pre-registration house officers in general practice. *British Medical Journal* **310**:369-372.

12 Illing J, Taylor G, Van Zwamberg T (1999) A qualitative study of pre-registration house officers in general practice. *Medical Education* **33**: 894-900.

Educational Supervisors views on the competencies of pre registration house officers.

British Journal of Hospital Medicine, **67**, 638-64.

Authors:

Simon Watmough, Ida Ryland (Research Fellow, Mersey Deanery), David Taylor, Anne Garden

Background

Many UK medical schools reformed their curricula to conform to the recommendations published in *Tomorrow's Doctors* (GMC, 1993). In this paper we demonstrate the effects of the change in the Liverpool curriculum on the competencies identified in *The New Doctor* (1997). In 1996, following *Tomorrow's Doctors* (GMC, 1993), the University of Liverpool reformed its medical curriculum from a traditional lecture-based medical curriculum (TMC) to a reformed medical curriculum (RMC) with integrated problem-based learning (PBL) introduced from years one to four largely replacing lectures. In the first year of Liverpool's reformed curriculum students are introduced to the "science of medicine" with subsequent years 2 to 4 incorporating developments of the human life cycle. Practical clinical skills are taught from the onset of the medical course with training taking place in the Clinical Skills Resource Centre. Formal communications training was not included in the TMC. In the reformed curriculum students are given specific communication skills training which they can develop in PBL and through clinical exposure and they are assessed on communication skills throughout the 5 year programme. Special Study modules (SSMs) offering a range of topics are available to students and approximately 30% of clinical attachments are community based. In the final year in readiness for progression from undergraduate trainee to the postgraduate junior doctor grade (pre-registration house officer (PRHO) the students are exposed to a year of intensive clinical experiences including eight week placements in accident & emergency departments and a "PRHO shadowing" attachment. The assessment procedures were also reformed. Final exams take place in the fourth year and include written papers and objective structured clinical examinations (OSCEs). The final year

is assessed through portfolio and a series of interviews called PETA (Professional Education & Training Appraisal).

Introduction

In order to evaluate the changes in the Liverpool curriculum a number of projects have been developed. For example Brown *et al* (2003, 2004) have reported the effect curriculum change has on the attitudes of Liverpool PRHOs to postgraduate training. In the UK all PRHOs are assigned consultant educational supervisors who have to gauge their performance during the PRHO year. In 1997 the GMC in *The New Doctor* (GMC 1997) laid out the skills attitudes and competencies it expects PRHOs to undertake after graduation. The focus of this paper is the use of questionnaires, based on the skills laid out on *the New Doctor* to gather the views of educational supervisors on the competencies of the Liverpool PRHOs they supervise. Data was collected on TMC and RMC graduates.

Study population

The study population comprises of Educational Supervisors of Liverpool graduate PRHOs from the following cohorts: 1999 (penultimate TMC), 2000 (final year TMC), 2001 (first year RMC) and 2002 (second year RMC).

The Questionnaires

Questionnaires, developed by the University of Manchester (Jones *et al*, 2001, Jones *et al*, 2002) containing 31 skills, attitudes and competencies from *The New Doctor* (GMC 1997) were sent to consultant educational supervisors in the Mersey Deanery, where the vast majority of Liverpool graduates undertake their PRHO training. The questionnaires asked the supervisors: "Please rate the Liverpool graduates on their competence in the following....". The answers were given on a 5-point Likert scale, which ranged from "generally not at all competent" to "generally very competent" with "generally quite competent" as midpoint.

Methods

The data was analysed using the Statistical Package for Social Sciences version 11.0 for windows (SPSS) and non-parametric tests (Mann Whitney *U*) have been used to test for significant differences. For the purpose of this paper and ease of presentation the questionnaire results have been summarised into the upper 2 points (more than generally quite competent), the mid point (generally quite competent) and the lower two points (less than generally quite competent). The results shown in this paper are the average of the supervisors' perceptions of the two traditional cohorts and two reformed curriculum cohorts. The questionnaires were distributed in May of each year, so the supervisors would have experienced their full quota of PRHOs per cohort. One follow up letter was sent to non-respondents a month later.

Results

The response rates were as follows: 69.8% (104/149), 70.6% (110/157), 77.6% (125/161) and 63.9% for (99/155) for cohorts 1999, 2000, 2001 and 2002 respectively.

The results in table one show the average of the 2 cohorts (1999 and 2000) pertaining to the traditional curriculum and 2 cohorts (2001 and 2002) pertaining to the PBL curriculum and the results of non parametric tests (p=>0.05) comparing the consultants perceptions of TMC and RMC PRHOs.

Twenty five of the 31 variables had improved on the more than midpoint scales when comparing the TLB with RMC graduates. Twelve of the questionnaire variables showed significant difference with ten of these variables rated more favourably for the RMC graduates.

Twenty nine supervisors completed the questionnaire for all 4 cohorts, 64 completed the questionnaires for the last cohort of the traditional curriculum and first cohort of the reformed curriculum. Seventy eight supervisors completed the questionnaires for 3 out of the 4 cohorts. There were 13 supervisors who only completed questionnaires

on RMC PRHOs only. The highest response rate was for the first cohort of the reformed curriculum so it could be that some supervisors were more motivated to take part in that survey and 15 more supervisors completed questionnaires for that cohort compared with the last cohort of the traditional curriculum. Some rotations do rotate supervisory responsibilities from year to year but the actual PRHO posts and rotations changed very little during the 4 years these questionnaires were distributed. Given the ambiguity in these figures it is hard to say whether there is any bias or impact in the overall results. However, as will be considered in the discussion there is a discrepancy in results between those who 64 supervisors who completed questionnaires on the final cohort of final TMC graduates and RMC and the rest of the results as a whole.

Table one

Educational supervisor ratings on competencies listed in *The New Doctor* *"Please the rate the Liverpool PRHOs on their competence in the following"*

Item in order as it appeared on the questionnaire	% of supervisors rating the PRHOs as (rounded up to nearest whole number) More than quite competent		quite competent		less than quite competent		*P*- value
	TMC	RMC	TMC	RMC	TMC	RMC	(<0.05)
Communicating effectively	49	64	46	31	5	5	0.001
Working in a team	53	62	41	31	6	6	ns
Being aware of limitations	56	55	37	39	7	6	ns
Understanding disease processes	23	15	56	59	21	15	0.002
Managing time effectively	26	35	48	48	35	17	0.031
Developing appropriate attitudes towards Personal health and well being	40	45	51	47	9	8	ns
Recognition of social and emotional Factors in illness and treatment	35	44	51	49	14	7	0.009
	TMC	RMC	TMC	RMC	TMC	RMCL	(<0.05)
Providing care for people of different Cultures	33	40	40	54	17	6	0.013
Coping with uncertainty	20	26	43	52	37	22	0.003

Making the best use of laboratory and Other diagnostic services	25	28	46	42	28	24	ns
Using informatics as a tool in Medical practice	34	61	45	31	20	7.9	0.001
Understanding the purpose and practice Of audit, peer review and appraisal	18	34	45	48	34	18	0.001
Understanding the relationship between Primary and social care and hospital Care	23	31	54	55	31	14	0.012
Using opportunities for disease prevention And health promotion	13	20	48	55	39	25	ns
Being aware of legal and ethical issues	14	26	52	54	34	20	0.001
Understanding the principles of evidence Based medicine	20	30	58	59	22	11	0.001
Diagnosis, decision making and the Provision of treatment including Prescribing	35	22	45	45	22	33	0.001
	TMC	RMC	TMC	RMC	TMC	RMC	(<0.05)
Keeping accurate records	42	50	47	40	12	10	ns
Obtaining valid consent	41	40	41	41	18	19	ns
Calculating accurate drug dosages	36	32	54	56	10	12	ns

Writing a prescription	38	44	53	49	9	7	ns
Venepuncture	46	53	45	42	9	5	ns
Arterial blood sampling	40	45	43	40	17	15	ns
Suturing	15	20	34	32	51	47	ns
Performing an ECG	32	33	47	47	21	21	ns
Basic CPR	39	44	53	44	8	6	ns
Administering oxygen therapy Safely	33	31	54	56	13	13	ns
Correctly using a nebuliser	30	27	49	59	21	14	ns
Inserting a nasogastric tube	17	17	32	39	52	44	ns
Urinary catheterisation	28	37	47	41	25	22	ns
Control of haemorrhage	21	22	55	53	24	25	ns

Discussion

The results indicate that the educational supervisors score the first two cohorts of graduates from the reformed curriculum as better prepared for the role of PRHO than the last two cohorts of the traditional curriculum. From the results it can be argued that the reformed curriculum is producing a different kind of PRHO compared with the traditional curriculum. Certainly, it is possible to suggest that the variables which showed significant improvements when comparing TMC with RMC PRHOs can be linked to curriculum reform.

Students now have structured communication skills classes in their curriculum and are encouraged to present to and collaborate with each other in PBL sessions. This should account for the improvement in "communicating effectively". The fact that 30% of the clinical placements in the reformed curriculum are spent in the community compared with four weeks only in the traditional course would explain the significant increase in "Understanding the relationship between primary and social care and hospital care". Through community placements, students are encouraged to be aware of the role of the patient in society and one of the main themes that run through the curriculum in the PBL scenarios is "individuals, groups and society" which could offer an explanation for why there was an improvement in "recognising the social and emotional factors in illness and treatment". These factors could also explain why supervisors feel the PRHOs have improved regarding "providing appropriate care for people of different cultures".

Improvement in "managing time effectively" correlates with the greater clinical exposure, particularly in the final year and the "shadow" attachment where students witness first hand the pressures of being a junior doctor and what their role will be after graduation. It is also possible that the RMC students benefit from having more freedom to manage their own study time than traditional students whilst working through PBL scenarios and choosing their own Special Study Modules.

The greater competency recorded in "using informatics as a tool in medical practice" may be down to students who have graduated more recently being more accustomed

to using computers whether at home or in school. It may also be down to the emphasis in the curriculum on finding evidence when working through the PBL cases and using the Internet for literature searches. This in turn may have helped lead to a greater improvement in "understanding the purpose of audit, peer review and appraisal", and "understanding evidence based medicine". The use of the portfolio in the final year and the teamwork needed in PBL sessions should have encouraged a greater understanding of peer review and appraisal, whilst students are assessed on understanding evidence based medicine in the portfolio. Many of the hospital placements and SSMs encourage the students to undertake audits. Legal and ethical issues are written into PBL scenarios and students are assessed on these during the course which should account for the improvement in "understanding legal and ethical issues". The trend for students showing a greater ability at "coping with uncertainty" could be down to the increased clinical exposure in the final year or the uncertain nature of working through PBL scenarios. Whilst none of the variables that have improved are solely down to the introduction of PBL it is possible to argue that the PBL process has had an influence in at least 8 of the 10 variables discussed above.

It can be seen as something of a concern about the significant decrease pertaining to "diagnosis, decision making and the provision of treatment including prescribing" and "understanding disease processes" – two variables which overlap to a large extent. The introduction of PBL into a medical curriculum can create uncertainty, in the short term but often unfounded, about knowledge base (Prince *et al*, 2003) (Kaufmann & Mann, 1998) (Jones *et* al, 2002) which may lead to a lack of confidence in diagnosis. It may be that these skills are developed through the PRHO year, particularly diagnosis and decision-making. One of the aims of the *New Doctor* (GMC, 1997) was to create conditions to improve the learning of PRHOs and supervision by senior staff reducing the responsibility on PRHOs. The revised *New Doctor* (GMC, 2005) places emphasis on understanding evidence-based medicine, which the RMC graduate PRHOs are seen as more competent at by the supervisors. It also stresses there should be senior supervision for diagnosis and treatments. Liverpool students are made aware of GMC documents which highlight the need to recognise limits of competence and consult colleagues (GMC 2005 a). These results could be part of a trend in recent years which sees junior doctors, fearing litigation themselves passing cases on for senior review or undertaking "defensive medicine"(Studdert *et al* 2005).Liverpool

students are assessed on diagnosis and managements skills in the final year portfolio and in OSCE stations earlier in the curriculum. If the final year supervisors have concerns about this then students will not graduate from the course.

It has also been reported that knowledge of aspects of acute care of PRHOs and SHOs in the UK is lacking. (Smith & Poplett, 2002). There is widespread concern throughout the UK about whether PRHOs have the knowledge and skills to prescribe effectively on appointment. (Farrah, 2002). A comprehensive literature search reveals very little regarding these areas for PRHOs. Also, there are no significant differences between two other questionnaire variables "writing a prescription" and "making appropriate use of laboratory and other diagnostic services". In fact both these variables, essential factors in patient management show improvement in favour of the RMC graduates. Sixty four supervisors completed questionnaires for the last cohort of the TMC and the first cohort of the RMC. This group did not see a significant difference between traditional and reformed curriculum graduates regarding "diagnosis, decision making and the provision of treatment" and "understanding disease processes" but did see the improvements in competencies with the study population as a whole.

It is surprising that more significant improvements were not observed for practical skills considering the additional clinical skills training students now receive. This may be a consequence of the blurring of the skills which PRHOs and nurses (Vallis *et al*, 2004) are expected to undertake. It is also important to remember that the supervisors might not necessarily see the PRHOs carrying out all the practical procedures listed on the questionnaire. The results indicate though, that the supervisors do regard the PRHOs as being competent particularly in skills such as venepuncture, CPR, catheterisation and keeping accurate records, all of which are important practical skills for PRHOs. The qualitative part of this study demonstrates that, when interviewed, supervisors feel the PRHOs are better prepared in this area and that it is those kind of clinical skills they expect from PRHOs, rather than skills such as suturing or inserting a nasogastric tube (Watmough *et al*, 2004). This study also showed that the supervisors felt that the PBL curriculum graduates were better prepared for the role of PRHO. We also asked supervisors which of the skills listed on the questionnaire were most important for their house officers. The five most popular

answers were "Communicating effectively" "working in team", "being aware of limitations", "keeping accurate records" and "managing time effectively" – all variables which scored well on the questionnaire results.

The New Doctor (GMC 1997) gave a blueprint for Deaneries when organising PRHO training and the Postgraduate Dean is responsible for ensuring that trainees meet these standards so they can enter the full medical register. Similarly, *Tomorrow's Doctors* (GMC 1993) gave a blueprint for the content of medical curricula and this study links the recommendations in both these documents from an undergraduate to postgraduate setting. The PRHO year itself has undergone reforms recently with the introduction of Foundation Programmes (DoH 2004) and the introduction of an updated version of *The New Doctor* (2005) The Foundation Programme aims to develop generic skill acquisition over a closely supervised two year period which includes developing confidence in diagnosis and managing acutely ill patients. Students at Liverpool undertake portfolio learning using similar assessment procedures to those they will experience during the Foundation Programme. Using the GMC guidelines (GMC 2005) for final year medical students and F1 and F2 trainees should ensure a seamless transition from the fourth year of medical school to the third postgraduate year. The introduction of the Foundation Programme and portfolio learning in the final year of the RMC now means that the essential skills of junior doctors required by the GMC can now be integrated, monitored and developed over a three year period.

If mid point, or "quite well prepared" is taken as the minimum competency level (Jones *et al*, 2001, Jones *et al*, 2002) then it can be seen as heartening that the majority of respondents rated the PRHOs from the PBL curriculum at this level and above on all the competencies listed on the questionnaire and that 25 of the 31 questionnaire variables had shown an improvement on the midpoint scales. These results show that curriculum reform can produce PRHOs who are perceived by educational supervisors as reaching the competencies required by *The New Doctor*.

Acknowledgements

We would like to thank all the Educational Supervisors who took part in this study. We would also like to thank the Mersey Postgraduate Dean, Dr David Graham for his support during this project.

References

Brown J, Graham D, Chapman T (2003) Factors influencing teaching and learning in the pre-registration year. *Hospital Medicine* **64:** 740-2

Brown J, Ryland I, Graham D, Chapman T (2004) Comparison of aspects of pre-registration house officer training from traditional and new medical curricula *Hospital Medicine* **65:** 745-747

Department of Health (2004) *Modernising Medical Careers.* London: HMSO 2004.

Farrah. K (2002) Time to review prescribing in hospitals by pre-registration house officers. *The Pharmaceutical Journal* February **268:**136

General Medical Council (1993) *Tomorrow's Doctors* General Medical Council, London

General Medical Council (1997) *The New Doctor.* General Medical Council, London

General Medical Council (2005) *The New Doctor.* General Medical Council, London

General Medical Council (2005a) *Good Medical Practice (Draft)* General Medical Council, London

Jones A, McArdle P, O'Neill P (2001) How well prepared for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Medical Education* **35:**.578-584.

Jones A, McArdle P, O'Neill P (2002) Perceptions of how well graduates are prepared for the role of pre-registration house officer: a comparison of outcomes from a traditional and integrated PBL curriculum *Medical Education* **36:** 16-25

Kaufman D, Mann K (1998) Comparing achievement on the Medical Council of Canada Qualifying Examination Part I of students in conventional and problem-based learning curricula. *Academic Medicine* **73:**1211-3

Prince K, van Mameren H, Hylkema N, Drukker J, Scherpbier A, van der Vleuten C. (2003) Does problem based learning lead to deficiencies in basic science knowledge? An empirical case study on anatomy. *Medical education* **37:**15-21

Smith G, Polett N (2002) Knowledge aspects of acute care in trainee doctors. *Postgraduate Medical Journal* **78:** 335-338

Studdert D, Mello M, Sage W, Desroches C, Peugh J, Zapert K, Brennan T (2005). Defensive medicine among high-risk specialist physicians in a volatile practice environment *Journal of the American Medical Association.* **293**: 2609-2617.

Vallis J., Hesketh A., Macpherson, S (2004) . Pre-registration house officer training: a role for nurses in the new Foundation Programme? *Medical Education* 2004; **38:** 708-716.

Watmough S, Taylor D, Garden A, Graham D. Consultants give their opinions on the competencies of PBL graduate PRHOs and curriculum change. Proceedings of the annual meeting of the Association for Medical Education in Europe; 2004 September 5 –8; Edinburgh

Does a new integrated PBL curriculum with specific communication skills classes produce Pre Registration House Officers (PRHOs) with improved communication skills?

Medical Teacher, **28**, 264-269.

Simon Watmough, Anne Garden, David Taylor

Summary

Over recent years communication skills training has played an increasingly important role in UK medical curricula. When The University of Liverpool reformed its medical curriculum in 1996 from a traditional lecture-based curriculum to an integrated Problem-based learning curriculum formal communication skills training was introduced into the course. The paper deals with a comparison between PRHOs' ideas about communication competencies for PRHOs who did receive communication skills training and those involved in a traditional curriculum without formal communication training. This has involved distributing questionnaires to PRHOs and their educational supervisors, holding focus groups with PRHOs and interviewing educational supervisors. Data has been collected on the last cohort of the traditional curriculum and first cohort of the new curriculum to allow comparisons between cohorts. The PRHO questionnaires show that both cohorts feel they are good communicators but the focus groups show different reasons for this. The traditional graduates feel it is because doctors are "natural communicators" and those skills can't be taught. The PBL graduates relate their communication skills to their undergraduate tuition and found they used these techniques when communicating as PRHOs. Both

the questionnaires and interviews with the consultants demonstrate they feel the communication of PRHOs has significantly improved.

Introduction

In 1993 the General Medical Council of the UK (GMC) published recommendations on reforming UK medical curricula (GMC 1993). In recognition of the importance of communication skills in affecting patient outcomes (Roter et *al.*, 1995) (Wagner et *al.*, 2002) and the perceived failure of some doctors to live up to the expectations of the public over communication, medical schools were encouraged to improve the communication skills teaching in undergraduate curricula (GMC 1993, 2003). Implicit in this was evidence that medical students did not automatically acquire the art of communication through clinical training alone (Doherty *et al.*, 1990) and that specific communication skills training can improve the competencies of students (Yedidia *et al.*, 2003) (Van Dalen *et al.* 2002). In 1996, The University of Liverpool reformed its medical course from a very traditional lecture-based course to an integrated problem-based learning curriculum. One of the objectives of the new course is specifically to produce graduates with a range of communication skills and attributes (University of Liverpool 2004). As part of a wider evaluation of the new course in Liverpool this piece of work concentrates on assessing the communications skills training of our graduates.

Under the previous curriculum there was little formal communication skills teaching or assessment. There was some training during a GP placement but the learning opportunities were very varied. The students in the current course learn

communication skills throughout their 5 years. In the first year they are timetabled ten compulsory small group tutorials at fortnightly intervals. In the second year, students tape-record a number of patient/relative recordings, which are then analysed by the student and presented to other students and facilitators in small groups. In addition specific communications skills topics are included in the second year PBL tutorials. Communication skills teaching continues in later years including during a 3-week attachment in the 4th year in palliative care and an 8-week community placement in the final year. Unlike the traditional curriculum students are assessed on their communication skills throughout the undergraduate course. This study looks at comparisons between pre-registration house officers (PRHOs) ideas about communication competencies for PRHOs who did receive communication skills training and those involved in a traditional curriculum without formal communication training and whether introducing communication skills classes into undergraduate medical education can improve graduates' communication skills.

Methods

Three research tools were employed; questionnaires, focus groups and interviews. Data has been collected on both traditional and PBL graduates in Liverpool as part of this project. This paper focuses on comparing the last cohort of the traditional course with the first cohort of the new and summarising the views of educational supervisors who had worked with the first PBL cohort. Both cohorts were selected for the medical course using the same admission criteria of A levels and interviews.

Questionnaires

Questionnaires, developed and validated by the University of Manchester (Jones *et al.*, 2001) (Jones *et al.*, 2002) were distributed to Liverpool PRHOs working in the Mersey Deanery and their educational supervisors from the last cohort (2000 graduates) of the traditional curriculum and the PRHOs and educational supervisors from the first cohort of the PBL curriculum (2001 graduates). The questionnaires are based on the key skills listed in *The New Doctor* (GMC 1997) which the GMC expects graduates to undertake as PRHOs. One of these key skills is *communicating effectively* and this was included on the questionnaire. For PRHOs the questionnaire asks "Please rate yourself on your competence in the following...." followed by the items. For the educational supervisors the questionnaire asks "Please rate the Liverpool graduates on their competence in the following....." with a list of the same items included in the PRHO questionnaire. As the consultants often supervise more than one PRHO a year they were asked to respond on the basis of a general perception of the graduates they supervise as a whole rather than the performances of individual house officers. This paper looks at the result for the questionnaire variable *communicating effectively.*

The respondents were asked to rate their answers on a 5-point Likert scale ranging from "generally very competent" to "generally not at all competent" with "generally quite competent" as the midpoint. For the purpose of this paper and ease of presentation the questionnaire results have been summarised into the upper 2 points (more than generally quite competent), the mid point (generally quite competent) and the lower two points (less than generally quite competent). The data was analysed

using the Statistical Package for Social Sciences version 11.0 for windows (SPSS) and non-parametric tests (Mann Whitney *U*) have been used to test for significant differences with the statistical tests based on the raw data. The response rates for the PRHOs were 67.5% (112/166) for the traditional graduates and 57% (92/161) for the PBL cohort. The response rates from the Educational Supervisors were 70.6% (110/157) for the traditional graduates and 77.6% (125/161) for the PBL cohort.

Focus groups

The groups were organised in local, Mersey Deanery, hospitals where the majority of Liverpool graduates take up their pre-registration posts. They were arranged between April and June so that participants would have experienced both medical and surgical attachments. Four focus groups were arranged with the last cohort of the traditional cohort (n =28), and five with the first PBL cohort (n = 33). The focus groups were held in the hospital postgraduate centres of the hospitals nearest to the University where the overwhelming majority of Liverpool graduates work after graduation. The centre managers were contacted with the permission of the Mersey Region Postgraduate Dean and asked to put aside at least an hour of protected time to encourage participation. Some, but not all the PRHOs knew prior to attending that focus groups were taking place, but they did not know the exact nature of the research. They were not aware that focus groups had taken place at other hospitals. PRHOs participated due to their attendance at the relevant teaching session and there was no pre-selection or influence on the make up of the groups and participation was entirely voluntary. Each focus group lasted about an hour with anonymity guaranteed to all participants.

The groups involved some pre-selected topics for discussion (Spencer & Richie 1994) and were based on the role of a PRHO according to the GMC (GMC 1997). One of the pre-selected topics was to ask the PRHOs about how the rated their own communication skills and their views on communication skills training. Apart from the PRHOs the only other person present during the focus groups was a non-clinical research assistant in the Faculty of Medicine (SW) and the PRHOs were made aware of his position within the University before the discussions were undertaken (Norris 1997) to reduce the chance of bias in the discussions. The focus groups were tape-recorded and were later transcribed word for word. These transcriptions were analysed and coded. The codes were developed into sub themes and themes before placed into definitive categories (Spencer & Richie 1994) (Strauss & Corbin 1998) (Miles & Huberman 1994). When the transcripts were coded and then analysed group influences were taken into account (Krueger 1997). This paper summarises the codes pertaining to communication skills of the PRHOs. Transcripts of the focus groups were available to colleagues to ascertain if they agreed with the final analysis.

Interviews

When the questionnaires for this project were delivered to supervisors in the May of 2002 a letter was included inviting the supervisors to take part in an interview to discuss the new curriculum in more detail. In the UK, every PRHO for each rotation has a named educational supervisor and the list of educational supervisors for each hospital in the Mersey Deanery area was obtained from the Deanery. Sixty supervisors out of the 161 in the Mersey Deanery returned the reply slip indicating

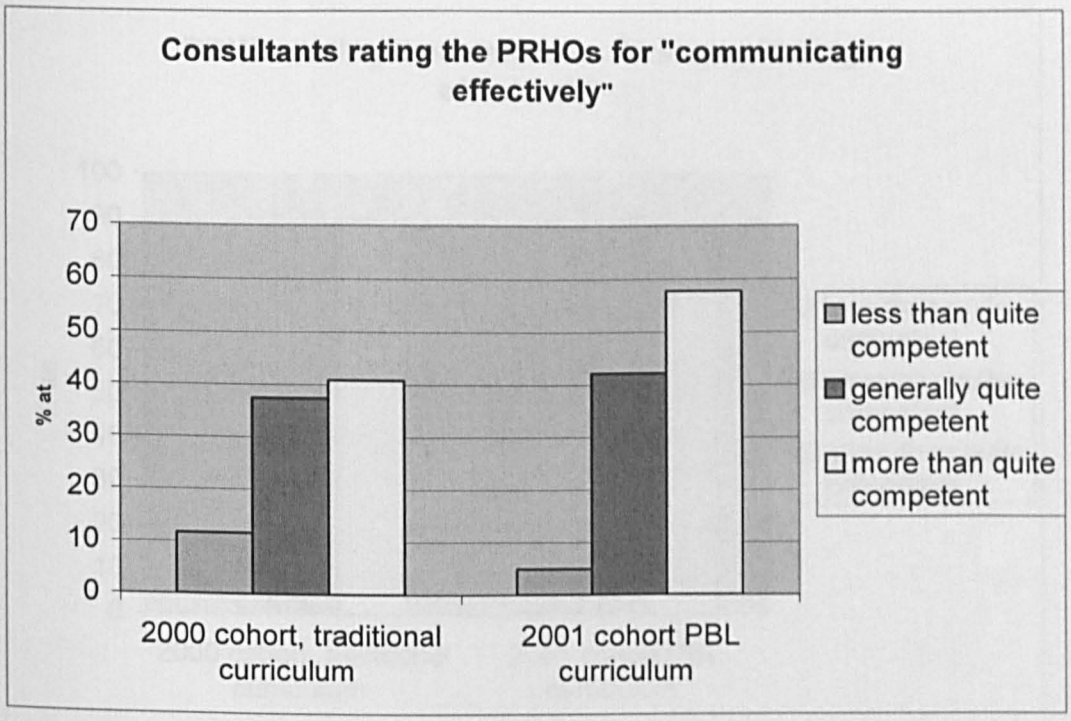
they would be willing to undertake such an interview. All volunteers were contacted 3 times and this formula decided who took part in the interview process. In total 41 interviews took place in the summer of 2002. The interviews took place with the supervisors in the hospitals at a time of their convenience, usually in their offices and generally lasted 30 to 40 minutes. Anonymity was offered to all participants. The semi structured questions related to how well prepared supervisors felt graduates had been to work as PRHOs and there was a specific question about the communication skills ability of Liverpool graduates. The interviews were analysed using the same methods as the focus groups.

Results

Questionnaires

Figure One

Educational supervisor ratings in percentages on "*Please rate the Liverpool PRHOs on their competence on.... "Communicating effectively"*

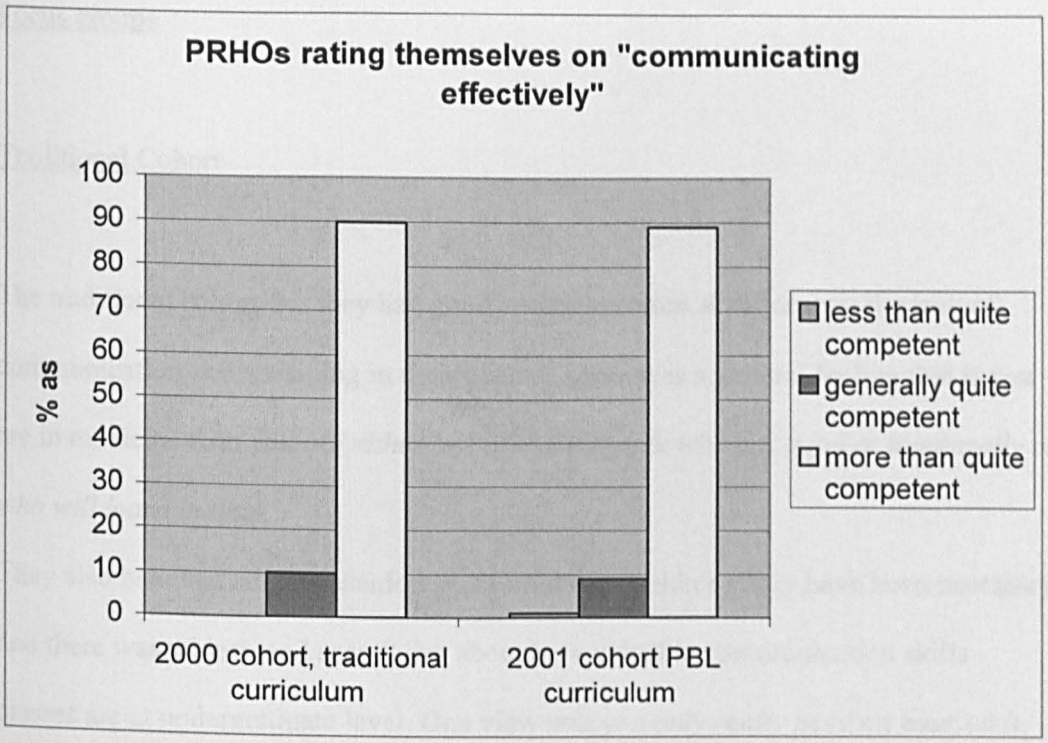


$X_2 - 8.032$, p=0.005

Figure Two

PRHO ratings in percentages on "*Please rate your competence on the following..*

"Communicating effectively"



X_2 – .308, p - NS

The consultants' perceptions of the graduates from the PBL curriculum compared with those from the traditional curriculum show a rise from 40.9% at more than generally quite competent to 56.8% with a fall from 11.7% to 5% at less than generally quite competent. Both cohorts of PRHOs on the questionnaire rated themselves as very competent regarding *communicating effectively* with the results were identical.

Focus groups

Traditional Cohort

The traditional cohort felt they had good communication skills despite the lack of communication skills training in their course. There was a general feeling that if you are in medicine then *you are either one of those people who are good at it naturally or who will learn in time.*

They also believed communication skills training wouldn't really have been necessary and there was widespread scepticism about how valuable communication skills classes are at undergraduate level. One view was *you only really need an hour on it, not loads and loads of role-play.*

Even when it came to breaking bad news they felt this wasn't something that could be taught or practised prior to graduation. *Nothing can prepare you for breaking bad news to patients. The new course do more, but at the end of the day you either can or you can't communicate well with patients.*

One group concluded *I'm sorry, but if you get to the final year or PRIIO year and you can't break bad news, then you shouldn't be a doctor. There would be something wrong wouldn't there?* There was a feeling that doctors were "natural communicators" so they hadn't missed out by not having formal instruction.

They did admit that what they experienced regarding communication as undergraduates was very varied but they didn't believe that this lack of structured teaching had hindered their ability or their competence when communicating as house officers.

The PBL cohort

The PBL graduates, like the traditional cohort felt they had good communication skills, and had encountered no problems in this area as PRHOs. However, they felt this was due to the communication skills training in the curriculum. *Comparing ourselves to say, SHOs who are more experienced than us, but haven't had the formal teaching or the SHOs who didn't do our course, we seem to do it very well.*

The PBL graduates recognised the benefits of having formal training although they felt there were too many classes. *A lot of us didn't like them at the time and some of the things were seen as daft, but it does help you, further down.* Although as students they couldn't always recognise the benefit of the classes at the time, all the PRHOs acknowledged that at some point they had related back to their undergraduate classes to help them communicate with patients or relatives.

They also found placements such as the palliative care attachment in the 4th year and final year GP placement where they undertake a number of one to one patient consultations useful for developing communication skills. It was also of note that the PBL PRHOs, unlike the last cohort of the traditional course also criticised the communication skills ability of their consultant supervisors. *Sometimes you think that they are doing it really badly and you think, God that was a bit tactless, why did you say that?*

Supervisor interviews

The supervisors felt that the new curriculum graduates were actually better at communicating than their traditional predecessors. They are seen as being better communicators with both patients and relatives.

I think for the first time ever patients have commented on the abilities of the PRHOs to get communications right... we never used to have that. The PRHOs were mute most of the time with patients and relatives and that is one of the enormous plus points.

They believed that they had more confidence than previously and it wasn't just in their speaking ability that improvements had taken place. *They are much better than the old. They have an understanding of verbal and non-verbal communication. They understand listening. It isn't just about speaking.*

There were many examples of how their improved skills manifested themselves. One surgeon spoke of a patient who came onto the ward as an emergency admission only to find out they had inoperable cancer. She found that the PRHO had already taken the initiative in dealing with the situation whereas in the past they would have waited for somebody more senior to take care of it. The supervisors also saw the PBL PRHOs as being able to communicate better with other health care professionals. *They are ....not over confident, confident communicators...work well as part of the doctors, medical team, they work well with the nurses and they are able to communicate with the nurses...* The PRHOs were also seen as being stronger at taking a history and undertaking presentations because of the communication skills classes.

It was also seen as playing a significant role in improving their overall performance as PRHOs. *I think they are well prepared to be house officers...they have skills previous house officers didn't have, communication being top of the list.*

This improvement was related directly by the supervisors to the classes within the course and this was very much welcomed. Many supervisors now it had happened see it as a long overdue development especially as the public expectations of the medical profession has changed. *It was something that needed doing, there are those in the profession who have been poor at it for a long, long time and that is something the profession as a whole needed to come to grips with.. it is good that PBL has allowed that to happen.*

Discussion

One of the aims of the new curriculum in line with recommendations of *Tomorrows Doctors* (GMC 1993) was to improve the teaching of communication skills. The consultant questionnaire data does show there has been significant improvement when comparing their perceptions of the first PBL cohort with the last traditional cohort over *communicating effectively.* In the interviews the supervisors were absolutely unequivocal that the new course is producing PRHOs with better communication skills and it was the supervisors themselves who volunteered to make comparisons between traditional and PBL graduates. Only a couple of interviewees had noticed no difference in communication ability between traditional and PBL graduates and felt communication training shouldn't have been introduced. There was a feeling during

the interviews that that their expectations have been raised by the new course students in the area of communication. The supervisors gave different examples of how they saw the PBL PRHOs as "better" communicators. In the interviews the consultants were able to elaborate on why and how they felt the PBL graduates were more competent communicators rather than filling just one variable on a questionnaire. The supervisors directly attributed the improvement it was due to the communication skills training which has been incorporated into the PBL curriculum. They also feel this teaching gives PRHOs more confidence with patients which, overall helps to ease the transition from student to junior doctor.

Although there was one more focus group with the PBL cohort than there was with the traditional cohort the views from the traditional graduate focus groups were identical to each other as were the views generated between PBL graduate focus groups. The stark difference in attitude to gaining communication skills came between the cohorts not individual focus groups. The last cohort of the traditional curriculum was very defensive about their course and critical of the new course, which may have reflected their views in the focus groups. The questionnaire results for the PRHOs are virtually identical and show they felt they were competent communicators with nearly 90% of traditional and PBL graduates rating themselves at more than generally quite competent for *communicating effectively.*

However both cohorts had different reasons for feeling they were competent communicators, which were shown in the focus groups. Although the PBL course PRHOs wanted fewer communication classes they felt they had benefited from being taught those skills. They used the techniques they had been taught in communication

classes when communicating as PRHOs and this had made them good communicators. The PBL graduates, unlike the traditional PRHOs were uneasy with some of the communication skills of their seniors and also reflected on placements in their course such as the 4th year palliative care placement or final year GP placement as useful for practising what they learned about communication. By contrast the PRHOs from the traditional curriculum didn't relate their communication skills to their undergraduate course or comment on the communication ability of their supervisors. They felt that they didn't need teaching in this area as doctors were "natural communicators" so they had the skills anyway. These differences in how graduates from different curricula conceptualise communication have been shown elsewhere in the UK (Willis *et al.*, 2003).

A possible drawback of the study could be the time at which the questionnaires were delivered. However, as both cohorts questionnaires were studied in the second part of the PRHO year (April to May time) then the supervisors would have just almost seen their full quota of house officers for that cohort. The fact that both cohorts of educational supervisor questionnaires were delivered "later" in the PRHO year means they will all be subject to the same bias. It might have been preferable to have a higher percentage of PRHOs responding although other studies have shown it is hard to gain higher response rates (Ward *et al.*, 1997). Both cohorts of the focus groups were held at the same time in the year (May – June period) so both cohorts will have been into their final PRHO rotation and were in a position to relate their undergraduate education to the skills and competencies required for the house officer year. They would therefore have had the equivalent exposure as junior doctors and by that time in the year had dealt with range of different situations regarding

communication. Of course the educational supervisors would have worked with more traditional graduates for longer than PRHOs but studies have shown that supervisors base their ratings on recent interactions (Ross 1989, Jones *et al.* 2002). In the interviews the supervisors made it clear that they could differentiate between traditional graduate PRHOs and the one cohort of the PBL graduates they had worked with.

It has been shown that students in Liverpool improve their communication skills in the early years of the course (Humphris & Kaney 2001) and further research may wish to focus on which aspect of the communication skills classes the PRHOs felt were most effective. The evidence in this paper, though clearly shows that the inclusion of formal communication teaching can make a difference to the abilities and attitudes of PRHOs to communication and the expectancies of educational supervisors. Both cohorts of graduates felt they were good communicators – the questionnaire data alone indicate that, but the focus groups show they have different reasons for believing that. This work also demonstrates the value of using qualitative and quantitative methods as it is possible through the focus groups to explain why the questionnaire results should be as they are. The results suggest that communication skills training can produce good, competent communicators.

Practice Points

- PRHOs feel they are good communicators whether or not they have had communication teaching but there is a difference in their perception of communication skills
- Graduates without communication teaching feel they are good communicators because "doctors are natural communicators"
- Graduates who have undergone undergraduate communication teaching refer back to techniques learned as undergraduates when communicating as junior doctors
- Educational Supervisors feel that communication skills classes in the medical curriculum produces graduates who are more competent communicators

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References

Doherty, E., O'Boyle, C.A., Shannon, W., McGee H., Bury G. (1991) Communications skills training in undergraduate medicine, *Irish Medical Journal,* 83,pp.54-6.

General Medical Council (1993) Tomorrow's Doctors. (London, GMC).

General Medical Council. (1997) *The new Doctor.* (London, GMC).

General Medical Council (2003) Tomorrow's Doctors 2nd edn. (London GMC).

Jones, A., McArdle P.J., O'Neill, P.A. (2001) How well prepared for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors, *Medical Education,* 35, pp. 578-584.

Jones A, McArdle P.J, O'Neill PA. (2002) Perceptions of how well graduates are prepared for the role of pre-registration house officer: a comparison of outcomes from a traditional and integrated PBL curriculum *Medical Education,* 36, pp. 16-25.

Humphris G.M. & Kaney S. (2001) Asessing the development of communication skills in undergraduate medical students. *Medical Education*, 35,pp. 225-231

Miles, M.B, Huberman M., A., (1994) *Qualitative data analysis : an expanded sourcebook.* 2nd edition. Thousand Oaks: Sage.

Norris N., (1997) Error, bias and validity in qualitative research. *Educational Action Research* 5, pp. 172-6

Ross M., (1989) Relation of implicit theories to the construction of personal histories. *Psychological Review,* 96, pp. 341-57.

Roter, D.L., Hall J.L., Kern, D.E., Barker R.L., Cole K.A., Roca R.P., (1995) Improving physicians' interviewing skills and reducing patients' emotional stress. *Archives of Internal Medicine,* 155, pp.1877-84.

Strauss, A., Corbin, J., (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* 2nd edn. London: Sage Publications

Ritchie, J., Spencer., L., (1994) *Qualitative data analysis for applied policy research.* In: Bryman A. Burgess RG (eds). Analysing Qualitative data. London: Routledge.

The University of Liverpool (2004) MBChB Generic Programme Handbook 2004/2005 (available at http://www.liv.ac.uk/FacultyMedicine/root/school%20of%20medical%20education/school%20office/handbooks/generic%20handbook0405.doc, accessed 4 October 2004).

Van Dalen J., Kerkhofs E., Van Knippenberg-Van Den Berg B.W., Can Den Hout H.A., Scherpbier A.J.J.A., Van Der Vleuten (2002). Longitudinal and Concentrated Communication Skills Programmes: Two Dutch Medical Schools Compared. *Advances in Health Sciences Education,* 7, pp. 29-40.

Wagner P.J., Lentz L., Heslop S.D., (2002) Teaching communication skills: a skills-based approach. *Academic Medicine*, 77, pp.1164.

Ward B., Moody G., Mayberry J.F., (1997) The views of medical students and junior doctors on pre-graduate clinical teaching *Postgraduate Medical Journal*, 73: 723-5

Willis, S., Jones A., O'Neill, P. (2003) Can undergraduate education have an effect on the ways in which pre-registration house officers conceptualise communication? *Medical Education,* 37, pp. 603-608.

Yedidia M.J., Gillespie C.C., Kachur E., Schartz M.D., Ockene J., Chepaitos A.E., Snyder C.W., LAZARE a., Lipkin M. (2003). Effect of Communications Training on Medical Student Performance. *Journal of the American Medical Association.* 290, pp. 1157 -1165

Pre-registration house officers (PRHOs) give their views about studying under a reformed medical curriculum.

Medical Education, **40**, 893 – 899.

Simon Watmough, Anne Garden, David Taylor

Introduction

In the UK the General Medical Council (GMC) is the body responsible for regulating medical education. In 1993 they issued recommendations in *Tomorrow's Doctors* which specify the knowledge, skills and attributes to be acquired during undergraduate education (1). Compared with the other countries the UK had been slow to tackle the problems facing medical education (2) and this document highlighted concerns that graduates were not being prepared for the role of pre-registration house officers (PRHOs) – the key aim of undergraduate medical education (1). The GMC called for an end to factual overload in curricula, integration of basic and clinical sciences and a move away from didactic teaching to encourage problem solving, critical thinking and life-long learning. Due to the changing expectations of patients, *Tomorrow's Doctors* called for the introduction of communication skills tuition and to reflect modern health care it recommended the introduction of community based education.

In 1996 the University of Liverpool introduced a medical curriculum encompassing many of these recommendations (3). Today there is increasing pressure on the medical profession around the world to demonstrate the outcomes of undergraduate medical education given the recent substantial academic and financial

investments (4). Many medical curricula in the UK and elsewhere have reformed curricula along the lines of the Liverpool curriculum. We wanted to find out what the graduates from a reformed curriculum felt about their course and how it prepared them for the role of junior doctor.

The Liverpool Curriculum

Previously, Liverpool had a very traditional lecture based course divided into pre-clinical and clinical sections. The reformed curriculum uses problem based small group work (PBL) as the main learning activity from years 1 –4. The tutorials are organised into series of modules, each of which lasts 2 weeks and is based on a clinical case. During the tutorials students generate group learning objectives which they research independently supported by learning materials including plenary sessions and on line resources. The old pre-clinical/clinical divide has been abolished to integrate science teaching throughout the course and clinical exposure increases year by year.

Students are introduced to practical and clinical skills in a Clinical Skills Resource Centre from the first semester (5). Students are also timetabled communication skills training in the first and second years and are assessed on communication and clinical skills throughout their undergraduate course. Student Selected Components (SSCs) account for approximately 25% of the course. Students on the traditional course only experienced 4 weeks of community teaching, now approximately a third of all clinical experience takes place in he community culminating in a 7 week placement in the final year. Year five is an intensive clinical

year specifically designed to prepare the students specifically for the PRHO year. This includes an opportunity for students to "shadow" their first PRHO post, a placement in Accident & Emergency and two selectives in advanced medical practice (SAMPS).

Methods

Five focus groups were held in the 5 hospitals closest to the University where the vast majority of Liverpool graduates go to work as PRHOs. In the UK PRHOs have to attend a pre-determined amount of "protected" teaching inhospital postgraduate centres. The centre managers were contacted with the permission of the Mersey region Postgraduate Dean and asked to put aside at least an hour and half of protected teaching time in order to encourage participation and reduce the impact on service commitments. PRHOs participated due to their attendance at the relevant teaching session and there was no pre-selection or influence on the make up of the groups. Some of the PRHOs knew before attending that focus groups were taking place, but did not initially know the nature of the research. They were not aware that focus groups were taking place at other hospitals. Each focus group lasted about an hour with anonymity guaranteed to all participants.

There were between 5 and 9 participants in each focus group and in total 33/190 of the cohort took part. The content of the focus groups matched the profile of the cohort as a whole with 18 females and 15 male participants. Two groups took place in teaching hospitals and three in district general hospitals to ensure a wide range of PRHO experiences. We wanted the PRHOs to discuss how well their curriculum had prepared them to work as PRHOs and what they felt about the content and structure of

the new course. We felt a group discussion with people who had all experienced the curriculum would deliver rich data (6) about the curriculum.

The sessions were arranged towards the end of the PRHO year (April – June 2002) so participants had experienced both medical and surgical attachments and therefore were able to reflect back and relate their experiences to their undergraduate education. Apart from the PRHOs the only other person present during the focus groups was the facilitator (SW), a non-clinical research assistant, with no managerial responsibility in the University, the PRHOs were made aware of his position within the university to reduce the chance of bias in the discussions (7).

The focus groups were tape-recorded and were later transcribed word for word. The groups involved some pre-selected topics for discussion were based on the role of a PRHO according to the GMC (8) and their views on the course, to ensure important details were covered. The analysis was based on the framework approach (9) which allows the objectives of the research to be determined prior to data collection. The transcripts were first read through to re-gain familiarisation with the data (9) (10). The data was then examined and charted (9) or coded (11) according to the original aims of the research for recurrent or emerging themes. (9) (11). The key themes which emerged are outlined in the results section of the paper. This approach helped us to gain a saturation of themes as the same questions were put before all 5 focus groups. With a homogenous group of participants saturation of themes is reached quite quickly (6) and after 2 focus groups we found no new themes were emerging. When the transcripts were analysed group influences were taken into account by referring to notes taken by the researcher at the time (12). It was important to verify the

information analysed from these focus groups and there were some themes which crossed codes (13). The other authors of this paper checked the transcriptions to cross-reference the codes and analysis of the researcher (14).

Results

Their competencies as PRHOs

All focus groups started with an open ended question "How well prepared were you for the PRHO year by the University?" PRHOs all insisted that they were very well prepared for their role. In particular they related this to the final year eight-week "shadow" placement (where they follow the PRHO who is working on their first rotation) which meant they knew what the job entailed when they arrived on the ward and the clinical experience of the other final year placements.

I think we were well prepared. I think all the shadowing and stuff we did in the 5th year gave us a reasonable basis of knowing what we had to as a House Officer (FG1).

They would have liked to have shadowed both medicine and surgery but were divided into whether the current shadow attachment should be split into two or extended to two eight week blocks. Remarkably little stress was reported making the transition from student to junior doctor.

As undergraduates they had experienced the practical skills they were expected to undertake as PRHOs such as IV cannulation, venepuncture, and catheterisation and experienced no problems in these areas. They had also undertaken more advanced

skills such as lumbar puncture and suturing. They also enjoyed the teaching they received from the Clinical Skills Resource Centre and felt that they had learned practical procedures and also other generic medical skills such as examination techniques. They had practised these skills in the Clinical Skills Resource Centre and the final year attachments, particularly A & E.

I think the most valuable placement for that kind of thing is the A & E without a doubt, you will have to suture, you will have to catheterise...gasses venflons, you couldn't just sit around and not do it. I think we were well prepared. (FG3)

The PRHOs not only enjoyed the attachment but believed examining, diagnosing and assessing patients in A & E as students was vital preparation for being a junior doctor. The PRHOs felt they were all good communicators and had benefited from communication skills training as undergraduates although they felt there were too many classes. However, they reflected on how they used techniques learned during their classes when communicating with patients and their families. This gave them confidence when dealing with difficult situations.

I don't think they are going to be the most exciting classes you could have, but I think everyone appreciates what you got from them. (FG3)

A large number had broken "bad news" to patients and a 4th year placement in a Marie Curie centre was seen as particularly beneficial for this. They also recognised the value of communication skills classes regarding eliciting a good history from patients.

The PRHOs felt there was too much community teaching, particularly in the early years and that overall the sheer volume of community teaching made it feel like they were being forced to train as GPs in the future. Also, the teaching was seen as being

of a variable standard compared with hospital placements. However the GP placements towards the end of the course were seen as more relevant, particularly the GP attachments in the later years of the course where they had one to one consultations with their patients and these were good preparation for working as PRHOs. They noted that, in the hospital, PRHOs usually undertake the primary assessment of patients on the wards and deal with common minor ailments. Significantly, they also felt that they understood the relationship between primary and secondary care.

The PRHOs felt that as a result of their course they had the required learning skills for postgraduate training, but they didn't necessarily recognise it as a positive at undergraduate level. They believed that due to the PBL in their course they had been "forced" to become self-directed learners. This was seen as a shock coming from the structured "A" level courses.

You have to remember that we came from an environment in the 6th form where everything was totally spoon-fed. (FG2)

They believed they were competent at literature searches and related this to undertaking

SSC's earlier in the course.

They expressed concerns about the perceived level of their knowledge of the sciences such as anatomy, pharmacology and pathology. However, none of the participants could illustrate how this had affected their ability to perform as PRHOs. They had enough knowledge to work as PRHOs, could understand managing patient care and none of them believed they had "failed" their patients as a result of poor science

knowledge. In relation to graduates who were educated under traditional curricula and in particular the traditionally educated students who were in the years above them at medical school they saw themselves at a disadvantage and felt "lacking" in knowledge of the individual sciences, with anatomy the weakest. Many believed they would have to work harder than traditional graduates when sitting professional exams, but they did not feel that would be insurmountable or that their perceived lack of science knowledge ultimately would hinder their careers. As undergraduates all of them had experienced supervisors on clinical attachments telling them that their curriculum couldn't produce doctors with the required science knowledge.

The structure of their course

Most of their comments about the course reacted to their difficulties in adopting to a radically different educational approach. They linked their perceived lack of basic science knowledge to what they saw as "lack of structure" in the two years of their course. They could see a role for PBL, but wanted more "guidelines" or "structure" alongside the PBL.

You have 6 or 7 people who have just got out of A level and have no idea what is relevant in medicine and in the first year you still need some direction of what is relevant. (FG5)

This ranged from having clearer learning "learning objectives", more input from the tutors or an increased number of lectures or plenary sessions to consolidate what they have learned. They said that they found it a culture shock in the transition from the structured British 6th form, system to a PBL course. For example some of the anatomy teaching takes place in the Human Anatomy Resource Centre and the sessions there

were not compulsory there were times when students didn't attend when they could have.

Because in the real world 200 18 year olds aren't going to go in there because it isn't compulsory. (FG3)

Although they didn't enjoy the lack of structure in the PBL they were more positive about the SSCs and SAMPs that they chose themselves.

However, they had enjoyed their course and they certainly weren't advocating a return to the traditional system.

It is a good course in principle, it just needs to be backed up by more solid learning. (FG4)

Although they hadn't experienced it at first hand they felt they had a good knowledge of the traditional curriculum due to there being 4 traditional cohorts above them when they were first years and all their clinical supervisors were traditionally educated which caused them some anxiety. They also felt like "guinea pigs" and that and that as undergraduates they had been "over evaluated".

Discussion

The introduction of the reformed curriculum in Liverpool was included to remedy some of the problems inherent in medical education which included information overload, lack of self-directed learning, poor communication and practical skills and making education more relevant to graduates' future roles (15). In the focus groups all the PRHOs felt they were very well prepared for the actual day-to-day job of being PRHO. Principally, this was down to the shadowing, which has been shown to be

very beneficial at other UK schools (16), the A & E attachment, early exposure to clinical skills teaching, and knowledge of communication techniques. They reported remarkably few problems making the transition from student to PRHO, and could undertake the tasks expected of them. In this respect the reform of the curriculum has met its objectives.

Reducing the "factual burden" on students and introducing problem-based learning has produced mixed results regarding science knowledge. This is a well-documented concern in the literature surrounding PBL. Prince *et al* have shown that Dutch PBL students feared they had much less of a knowledge base than their traditional counterparts despite tests revealing no differences (17) (18). A paper by Antepohl *et al* shows in the long-term Swedish PBL graduates haven't been hindered undergoing a reformed PBL curriculum (19). McKeown *et al* have shown there is evidence of a lessening of anatomy knowledge after the move from a traditional type course (20). It remains to be ascertained what level of basic science is needed (21) (22) in undergraduate medical education as guidelines are not clear (23).

When Liverpool introduced the curriculum very few doctors in the Liverpool area would have experienced such a course and the PRHOs did feel that they were supervised by doctors on clinical attachments with little understanding of the curriculum. It is possible that criticism of the course causes uncertainty over science knowledge. It has also been suggested that students going through a new course are more likely to be less confident in knowledge acquisition as they have no one above them to refer to (24). The PRHOs said that they knew enough science to work as house officers and in the post PRHO setting and care for their patients, yet

they would feel more comfortable if they had had more direction for science teaching. Part of the curriculum reform was to encourage lifelong learning and people with competent learning skills (1). Although there has been concern raised about this recently (25) it is still a key aim of PBL curricula and is a clear expectation of the GMC (26). The graduates recognise that the PBL element of the course has engendered in them "self-directed" learning skills as requested by the GMC and that this could be beneficial when sitting professional exams. But they did not see the learning skills they had as something particularly to be proud of and that it had been "forced" on them. It could of course be that they only truly appreciate this ability further on in their careers.

Tomorrow's Doctors (1) stressed the need to increase community-based education. The

PRHOs resented the amount of time they spent in primary care and that they felt like they were being "forced" to be GPs. Although they could recognise the benefit of community undergraduate education and the experience assisted preparation for PRHO hospital posts they were disillusioned with some of their community placements, which may have a negative impact on career choice. There have been calls to increase the number of GPs (27) and it would be hoped a large number of this cohort would enter general practice.

The fact that they felt they had been over appraised as students and were "guinea pigs" is something to be borne in mind for other medical schools who are evaluating their new courses and for planned evaluations of Modernising Medical Careers (28)

(29). Undergraduate and postgraduate medical curricula around the world are undergoing constant revision. Whilst there may be sound reasons for this they may not be appreciated by the people who first have to undergo training under them.

As focus groups can generate more critical comments than interviews (30) the PRHOs certainly took the chance to air any grievance as inevitably there were a number of "teething problems" with the new course. If any PRHO felt they had not been prepared for the role of PRHO they would certainly have voiced this opinion. However despite
their concerns all the PRHOs concluded that the course had offered good preparation for the house officer year. These focus groups show that the consumers of a reformed curriculum incorporating the recommendations of *Tomorrow's Doctors* feel it is offering necessary preparation for the first postgraduate year.

References

(1) General Medical Council. *Tomorrow's Doctors*. London: GMC ;1993.

(2) Bligh J and Parsell G. The changing context of medical education. *Postgrad Medical Journal.* 1995; 71:397-403.

(3) Bligh J. Identifying the core curriculum: the Liverpool approach *Medical Teacher* 1995; **17**: 383-390

(4) Wood D. Evaluating the outcomes of undergraduate medical education. Medical

Education 2003; **37**: 580-581

(5) Bradley J and Bligh J. One years experience with a clinical skills resource centre. *Medical Education* 1999;**33**:114-120

(6) Morgan D. *Focus Groups as Qualitative Research.* 2nd Edition. Sage: London; 1997.

(7) Norris N. Error, bias and validity in qualitative research. *Educational Action Res* 1997;**5**:172

(8) General Medical Council. *The New Doctor.* London: GMC;1997.

(9) Ritchie J, Spencer L. *Qualitative data analysis for applied policy research.* In: Bryman A. Burgess RG (eds). Analysing Qualitative data. London: Routledge; 1994.

(10) Frankland J, Bloor M. *Some issues arising in the systematic analysis of focus group materials.* In: Barbour & Kitzinger *Developing Focus Group Research. Politics, theory and Practice.* Sage: London; 2001.

(11) Matthew B. Miles, A. Michael Huberman *Qualitative data analysis: an expanded sourcebook.* 2nd Edition. California: Sage; 1994

(12)Krueger RA. *Analysing and reporting focus group results.* California: Sage; 1997

(13) Worthen B., Sanders J, Fitzpatrick J 1997. *Program Evaluation. Alternative approaches and Practical Guidelines*. New York: Longman; 1997

(14) Agar M and Macdonald J Focus groups and ethnography *Human Organisation*1995:54: 78-86

(15) Calman & Donaldson The pre-registration house year: a critical incident study. *Medical Education* 1991;**25**: 51-59

(16) Lemp H, Cochrane M, Seabrook M, Rees J. Impact of educational preparation on medical students in transition from final year to PRHO year; a qualitative evaluation of final year training following the introduction of new year five in a London Medical School. *Medical Teacher* 2004; **26**:276-278

(17) Prince KJ, van Mameren H, Hylkema N, Drukker J, Scherpbier AJ, van der Vleuten CP., Does problem based learning lead to deficiencies in basic science knowledge? An empirical case study on anatomy. *Medical education* 2003 **3715-21**

(18) Prince KJ, van Mameren H, Scherpbier AJ, Hylkema N, Drukker J, , van der Vleuten CP Do students have sufficient knowledge of clinical anatomy? *Medical Education* 2005; **39**: 326-332.

(19) Antepohl W, Domeij E, Forsberg P, Ludvigsson J. A follow up of medical graduates of a problem-based learning curriculum. *Medical Education* 2003; **37**:155-162.

(20) McKeown PP, Heylings DJ, Stevenson M, McKelvey KJ, Nixon JR, McCluskey DR. The impact of curricular change on medical students' knowledge of anatomy *Medical Education* 2003; **37**:954 – 961

(21) Clack, GB. Medical Graduates evaluate the effectiveness of their undergraduate medical education. Medical Education 1994;**28**: 418-431

(22) Rudland JR & Rennie SC The determination of the relevance of basic sciences learning objectives to clinical practice using a questionnaire survey. Medical Education 2003: **37**:962-5.

(23) Leinster S. Standards in medical education in the European Union. *Medical Teacher*, 2003;**5**:507–509

(24) Kaufman & Mann K. Achievements of Students in a Conventional and Problem-Based Learning Curriculum. *Advances in Health Sciences Education*1999;**4**:245-260.

(25) Norman G. Beyond PBL. *Advances in Health Sciences Education* 2004; **9**: 257-60.

(26) General Medical Council. *Tomorrow's Doctors* (2003). London: GMC 2003.

(27) Department of Health. *Medical Schools: Delivering the Doctors of the Future.* Department of Health 2004.

(28) Department of Health. *Modernising Medical Careers: the next steps.* London: HMSO; 2004.

(29) Department of Health (2003*) Modernising Medical Careers.* London: HMSO; 2003.

(30) Kitzinger, Jenny. Introducing Focus Groups. *British Medical Journal* 1995;**311:**299-302

Educational Supervisors evaluate the preparedness of graduates from a reformed UK curriculum to work as Pre-registration House Officers (PRHOs): A qualitative study. *Medical Education*, **40**, 995 – 1001.

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Introduction

Medical curricula in the UK have undergone reform since the 1990s. The many reasons for change were outlined in the UK General Medical Council (GMC) document *Tomorrow's Doctors* (1). The principle concerns were that doctors felt inadequately prepared to cope as a result of undergraduate training (2) (3). The GMC (4) wanted to develop doctors capable of independent learning and critical thought (5). It was also recognised that students would benefit from a reduction in the factual burden knowledge, require lifelong learning skills to reflect the advances in medicine and that examination and history skills needed to be improved, along with graduates' team working, communication and practical skills (1) (6).

Background

In order to remedy those problems The University of Liverpool introduced a new curriculum in 1996 (7) (8). Previously, Liverpool had a very traditional lecture-based traditional curriculum. Problem-based learning (PBL) is the main learning activity from years 1 – 4 supported by increasing clinical contact and skills training. Students learn communication skills throughout their 5 years and are introduced to clinical skills training in a specially designed resource centre from year 1 where they learn

history taking, examination skills and practical procedures (9). 30% of clinical attachments now take place in the community. Other changes have included the introduction of options through Special Study Modules (SSMs) where students study a range of topics in depth. The final year is an apprenticeship designed to prepare students for postgraduate work. It involves five clinical attachments consisting of "shadowing" PRHOs, an Accident and Emergency placement, a community placement and two specialist attachments which the students chose.

PRHOs are assigned educational supervisors through the local Deanery who are responsible for gauging their performance and their preparedness at the end of the PRHO year to enter the medical register. As the curriculum had undergone extensive reform we wanted to ascertain from the people responsible for assessing the graduates whether the reformed curriculum was producing competent PRHOs. Even though interviewing the supervisors, rather than distributing questionnaires, restricted the sample size we felt interviewing the supervisors would gather richer data on their views of the PRHOs (10).

Over 90% of this cohort took their PRHO rotations in the Mersey Deanery and all the supervisors were familiar with Liverpool graduates and students. We did not specifically ask them to compare and contrast traditional and reformed curriculum graduates - in the previous year we had interviewed supervisors about the competencies of traditional graduates in a pilot study – however as all the interviewees had supervised traditional graduates for an average of 8 years they volunteered comparisons in response to the questions.

Methods

In May 2002 a list of the 161 educational supervisors and their rotations in the Mersey Deanery was gathered and they were sent a letter inviting them to take part in an interview as part of an overall evaluation of the curriculum. Over 60 supervisors volunteered to be interviewed and 41 were arranged with the other volunteers being interviewed the following summer. The 2002 interviews reflected the profile of the Deanery PRHO rotations at the time. Thirty one interviewees were male and ten were female and at the time the majority of supervisors were men. Sixteen were located in Teaching Hospitals and twenty-two in the District General Hospitals. Fifteen were surgeons, 23 were physicians and 3 were GPs. The interviews took place in their offices and generally lasted 30 – 40 minutes. Interviews were undertaken in the period June – September 2002 so the supervisors would have had at least 10 months working with the first cohort from the reformed curriculum who graduated in the summer of 2001.

Analysis

23 pilot interviews with supervisors took place in the summer of 2001 with only 7 of those interviewees included in this study. Pilot interviews focused on the competencies of the traditional graduates and were analysed prior to the interviews of 2002. The interviews proved that the topics included were valid, that supervisors were comfortable talking to the interviewer about the competencies of PRHOs (11 12) and that 23 interviews would be enough to gain a saturation of themes.

To reduce the possibility of bias (13), the interviewer was a non-clinician researcher (SW), who prior to the interviews was generally unknown to the supervisors, and not

in a management position within the University. The interviews were tape-recorded and then transcribed *verbatim*. The analysis was based on the framework approach which allows the objectives of the research to be determined before data collection (14). The prior objectives were the expectations from the GMC in *The New Doctor* (15) and *Tomorrow's Doctors* (1) and covered how well prepared the supervisors felt the graduates were for the role of PRHO, communication skills, basic science knowledge, history and examination skills, awareness of limitations, ability to undertake practical skills, attitudes and teamwork. The text was coded by the researcher for any emerging themes and sub-themes from within or outside the original objectives which were then developed into themes or categories within a coding framework which were applied to all the transcripts (11, 14) with the other authors checking the codes and analysis. Saturation was ensured through the coding framework applied to all transcripts (14) which meant all the themes and categories from each individual interview are placed in the overall framework so it was clear when no new themes were emerging. Fifteen interviews are often adequate for an interview project (10) and saturation was reached at about 20 interviews. More interviews were undertaken as we did not want to discriminate against volunteers.

Results

The opening question to all the interviews was "How well prepared do you think the new cohort have been for the House Officer year?" The overwhelming majority of the supervisors felt the PRHOs had been well prepared for the job of house officer and knew exactly what the job entailed when they started their posts.

I think they have been well prepared actually.....I mean certainly this year I have had 4 outstanding house officers who have been as good as anyone I have worked with over the last 20 years. (S15 surgeon)

The eight-week final year shadowing attachment where they follow the PRHO who is working on what will be their first house rotation was seen as particularly useful.

I think they are extremely well prepared and having had the shadowing they know what to expect. (S6 Physician)

All the supervisors had worked with traditional graduates and the consensus was that the reformed curriculum graduates were better prepared for the role:

and having had experience of the previous PRHOs I would say this current lot are far better prepared for the job than their predecessors.... (S2 Physician)

Knowledge base

This was the most difficult section of the interviews to analyse and little consensus or common ground emerges on this issue. Nearly all interviewees recognise that the PBL graduates know "less science" or have been taught less science than traditional graduates. For some supervisors this was a major concern and a big issue.

I don't think they know quite so much anatomy or anything like that. (S8 surgeon)

I would say they are less knowledgeable than someone with an A level in say, biology or zoology. (S10 surgeon)

Other consultants less so –

I think on a practical basis it is good if not better than their predecessors.. the applied anatomy is good.. (S15 surgeon)

Not all supervisors felt the knowledge of the traditional graduates was of the required standard.

> *I have not been appalled at their basic knowledge at all....about the same (as the old) – all pretty mediocre.* (S37 surgeon)

Many interviewees discussed the Royal College exams and felt that these PRHOs may be at a disadvantage, but then they reflected on taking their own postgraduate exams and how they had to learn/relearn basic sciences which they had covered in their undergraduate course.

> *I don't believe they will be at a disadvantage, you have to go back to the bookwork anyway.* (S39 physician)

Some felt it might take them longer to sit their exams. There were supervisors who felt that it was impossible to know everything anyway so it didn't really matter as they could find out what they needed to know.

> *If you asked me to quote the course of the lingual nerve I wouldn't know where to begin but, like these students, I know where to get it.* (S41 physician)

Different supervisors had different expectations depending on speciality. Generally, knowledge of physiology was seen as better than anatomy, and surgeons had more concerns than physicians. However, another supervisor said their anatomy knowledge was fine but their prescribing could be improved. It was almost as if some felt there was just "something missing" compared with previous graduates regarding knowledge. They attributed this to the perceived lack of structure in using problem-based learning as the main learning tool and they were not convinced this could impart all the necessary science knowledge. Many would have liked the course to have more lectures alongside the PBL, but not scrap the PBL. However, three

supervisors reported timidity in using knowledge base to diagnose in junior doctors of all grades, which they put down to hospital policies on responsibility for treatment and fear of making mistakes. There were virtually no worries about their knowledge level to work as PRHOs, however and none of the GPs had any qualms about knowledge base.

Communication skills

The ability of PRHOs to communicate and the introduction of communication skills training were seen as one of the most positive developments to come out of the new course. The communication skills classes were seen as producing junior doctors much more competent in this area than previously.

> *They are much better than the old. They have an understanding of verbal and non-verbal communication. They understand listening. It isn't just about speaking.* (S14 physician)
>
> *I think for the first time ever patients have commented on the abilities of the PRHOs to get communications right.* (S37 surgeon)

There were numerous examples of how well the PRHOS dealt with difficult situations such as breaking bad news and how well they communicate with other health care professionals.

Practical skills

The students in the new course at Liverpool are exposed to clinical skills training from the first semester. Here, the consensus was that they were competent at the practical skills they were expected to carry out such as venepuncture and catheterisation. The supervisors attributed this competence to the Clinical Skills Resource Centre (3) and the clinical exposure in the final year.

> *Well they are better than they were, yes. I mean the basics they need like cannula and catheter they are much better at than previously.* (S20 physician)

Some supervisors gave examples of PRHOs carrying out more advanced skills such as lumbar puncture, there was consensus they could carry out the skills they are expected to undertake regularly. Like communication skills, the improvement in the ability to undertake tasks was attributed to formal teaching.

The supervisors saw the improved ability of PRHOs in communication and practical skills as giving the PRHOs more confidence in performing the everyday tasks of a PRHO compared with traditional graduates and this eased the transition from student to junior doctor.

History and examination skills

The PRHOs were seen as being able to elicit a comprehensive and relevant history. They were certainly seen as better at taking a history than traditional graduates and this was related to an overall improvement in communication skills in the new course.

There was less of a consensus on their ability to exam patients. Three quarters of the interviewees felt they had a good grasp of what was required and could do it well. However, a minority did have concerns about examination and these were the supervisors most concerned about knowledge base.

Limitations

This was seen as a very positive aspect of the students' performances as PRHOs. They were seen as very aware of what they couldn't do and asked for help at the relevant times.

> *I think they are very good at recognising their limitations. I don't see anyone coming in thinking they are above their station; they have a grasp of what they cannot do.* (S24 physician)

Learning skills

One of the goals of a PBL curriculum is to facilitate learning skills in students (16). Although there was little consensus of how this should manifest itself in PRHOs 18/41 of the interviewees said that the reformed curriculum definitely had an impact in this area. They illustrated this by saying the PRHOs had better problem solving skills, literature searching skills and were more likely to go and look up something they didn't know or were more "questioning" of the supervisors. Thirteen interviewees said they believed there had been an improvement but it was hard to quantify. Only ten supervisors said they had noticed no difference between the traditional and reformed curriculum graduates.

Attitudes

The supervisors felt that the PRHOs were hardworking and showed good attitudes when they were on the wards.

I think they appear to be a good bunch (S10 surgeon)

I am struck by their enthusiasm..... they are not clockwatching..(S30 physician)

Also, although only a small number made this point a few supervisors felt that because of the reformed curriculum the PRHOs were less jaded or "ground down" than previous graduates. Since moves towards interprofessional education are increasingly promoted (17) it was especially important that the PRHOs were seen as good team workers who had a better understanding of the role of different health care professionals in patient care compared with traditionally educated graduates.

Discussion

There is the possibility of bias in the recruiting process since all participants were volunteers, for instance those supervisors who were particularly unhappy with the reformed curriculum might be more likely to volunteer. 23 pilot interviews took place before the interviews discussed in this paper and a further eighteen took place a year later. Therefore, a wide cross section of between a third and half of the Mersey educational supervisors have been interviewed over a 3-year period. At least two supervisors (medicine and surgery) from each of the seven Deanery Hospital Trusts with Liverpool graduates were involved in the interviews reported here.

As the supervisors had one cohort to work with at the time of these interviews it is possible their views were skewed somewhat by the small numbers involved. Many of the interviewees had worked in the Liverpool area for many years so had seen plenty of graduates from the traditional course but had only experienced a few house officers from the new curriculum. However, the supervisors generally referred to the PRHOs "as a whole" and made very few references to individual house officers, so it appears they had gained a holistic view of the PRHOs as a cohort. As all supervisors had worked with the "traditional" graduates for many years they already had a mindset about their abilities, which made it easier to differentiate between graduates. It was the supervisors who initiated any comparisons that arose suggesting they felt they had seen enough from this one cohort to draw their conclusions.

There are plenty of positive findings to come out of these interviews. It has been shown that graduates from reformed curricula can feel better prepared to work as junior doctors (18 19 20). These interviews show that consultants feel a reformed curriculum can produce competent junior doctors who are better prepared for the role of house officer than previous cohorts. There was near unanimity that they were competent communicators, had good attitudes, were aware of limitations, had good practical and history taking skills, were team workers with a good interprofessional understanding and only a minority had failed to notice any change in learning skills. In fact in all these aspects they were seen as better than previous graduates – areas particularly relevant to PRHOs.

The only controversial aspect to come out of the interviews was the knowledge-base issue and it is worth looking at this in more detail as all interviewees had a slightly

different take on the PRHOs' knowledge ability. The only common ground on knowledge base is that the old system gave tried to instil "too much" and largely irrelevant knowledge. Worries about knowledge levels are nothing new in medical education. In the 1870s the College of Physicians complained about the knowledge of physiology and anatomy at one medical school (21). Flexner (22) in 1925 wrote that the curriculum was overcrowded leading to problems in knowledge retention and the GMC on many occasions has alluded to this in recommendations on medical education going back to the 1860s (6) (23). These interviews raise wider issues about the content of a medical course, as there is no agreement on whether or how deficient the basic science knowledge is and in which areas. Many consultants had a different angle on this depending on their specialty. However, not all supervisors thought the knowledge base of the traditional graduates was of the required standard. It has been illustrated by Prince *et al* concerning anatomy that there are different expectations of science knowledge (24).

Even if the Liverpool students do "know less" then this is within the guidelines for reforming medical curricula to reduce factual burden (1) (25). The guidelines from the Quality Assurance Agency in the UK and from the European Union pertaining to undergraduate knowledge level are not specific (26) and for the UK should be kept to the "bare minimum" (25). Many supervisors admitted they had not remembered what they had been taught from their traditional course and they had to work very hard and learn from scratch or relearn sciences for their Royal College exams. One surgeon said

> *You have to remember not to quiz them like a traditionalist.* (S16 surgeon)

It has been shown that the potential aims and advantages of PBL may be lost if students are examined in a manner inconsistent with PBL principles (27). A study using the Canadian licensing examinations showed no significant differences between graduates of a traditional and PBL curriculum regarding knowledge base (28) and a similar study in the United States suggests PBL (29) graduates perform better.

Whereas the "knowledge issue" was due to the reformed curriculum, so were the improvements in competencies according to the supervisors. It could be that uncertainty over knowledge base may be the price paid for reducing the factual burden and improving preparedness for professional practice. These interviews do show that this selection of supervisors feel curriculum reform can improve the preparedness of PRHOs.

References

(1) General Medical Council. *Tomorrow's Doctors. Recommendations on Undergraduate Medical Education* London: GMC; 1993

(2) Calman & Donaldson The pre-registration house year: a critical incident study. *Medical Education* 1991;**25**: 51-59

(3) The Edinburgh Declaration. *Medical Education.* 1988; **22**: 481-487.

4 General Medical Council. *Guidelines for undergraduate medical education.* GMC, London: 1991.

5 Fraser RC. Undergraduate Medical Education: present state and future needs. *British Medical Journal.* 1991; **303** : 41-43.

6 Bullimore, David. *Study Skills and Tomorrow's Doctors.* W.B.Saunders: London 1998

7 Bligh, J. Identifying the core curriculum: The Liverpool approach. *Medical Teacher* 1995; **17**: 383-390

8 University of Liverpool. Generic Student Handbook (on line) (accessed 7/06/2005 Available from: http://www.liv.ac.uk/sme/root/school%20of%20medical%20education/school%20office/handbooks/generic%20handbook0405.doc

9 Bradley and Bligh. One years experience with a clinical skills resource centre. *Medical Education* 1999;**33**:114-120

10 Kvale, S. *Interviews. An Introduction to Qualitative Research Interviewing.* Thousand Oaks: California: Sage; 1994

11 Matthew B. Miles, A. Michael Huberman *Qualitative data analysis: an expanded sourcebook.* 2nd Edn. Thousand Oaks: California: Sage; 1994.

(12) Denzin NK & Lincoln Y.S. (Eds) *Handbook of qualitative research.* Thousand Oaks: California : Sage;1994

(13) Norris N. Error, bias and validity in qualitative research. *Educational Action Res* 1997;5:172

(14) Ritchie J, Spencer L. *Qualitative data analysis for applied policy research.* In: Bryman A. Burgess RG (eds). Analysing Qualitative data. London: Routledge, 1994.

(15) General Medical Council. *The New Doctor.* London: GMC; 1997.

(16) Albanese M.A. & Mitchell S. Problem-based learning: a review of the literature on its outcomes and implementation issues. *Academic Medicine* 1993; **68**: 52-81

(17) Department of Health. Working Together – learning together: a framework for lifelong learning in the NHS. London: Department of Health; 2001.

(18) Willis S, Jones A, O'Neill P. Can undergraduate education have an effect on the ways in which pre-registration house officers conceptualise communication? *Medical Education* 2003; **37**: 603-608

(19) O'Neill P , Jones A, Willis S, & McArdle P. Does a new undergraduate curriculum based on *Tomorrow's Doctors* prepare house officers for their first post? A qualitative study of the views of pre-registration house officers using critical incidents. *Medical Education,* 2003; **37**: 1100-1108.

(20) Prince K, Van Eijs P, Boshuizen H, Van der Vleuton C, Scherpbier A. General competencies of problem-based learning (PBL) and non-PBL graduates. *Medical Education,* 2005; **39** : 394-400

(21) Poynter, Frederick Noel Law. *The Evolution of Medical Education in Britain.* Pitman Medical Publishing Co. limited: London;1966.

(22) Flexner, A. *Medical Education.* New York; 1925

(23) Stacey, Margaret. *Regulating British Medicine. The General Medical Council.* John Wiley & Sons: Chichester 1992.

(24) Prince KJ, van Mameren H, Scherpbier AJ, Hylkema N, Drukker J, , van der Vleuten CP Do students have sufficient knowledge of clinical anatomy? *Medical Education* 2005; **39**: 326-332.

(25) General Medical Council. *Tomorrow's Doctors. Recommendations on Undergraduate Medical Education* London: GMC; 2003

(26) Leinster S. Standards in medical education in the European Union. *Medical Teacher,* 2003;**5**:507–509

(27) Kaufman DM. & Mann K. Achievements of Students in a Conventional and Problem-Based Learning Curriculum. *Advances in Health Sciences* 1999;**4**:245-260.

(28) Kaufman D.M., Mann K.V. Comparing achievement on the Medical Council of Canada Qualifying Examination Part I of students in conventional and problem-based learning curricula. *Academic Medicine*, 1998;**73**:1211-3.

(29) Blake R.L, Hosokawa M.C., Riley S.L. Student performances on Step 1 and Step 2 of the United States Medical Licensing Examination following implementation of a problem-based learning curriculum. *Academic Medicine*, 2000 ;**75**:66-70.

PRHOs assess their skills and competencies through questionnaires

British Journal of Hospital Medicine, 67, 487 – 490.

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Background

Since the General Medical Council (GMC) gave recommendations on the content of medical curricula in the UK in *Tomorrow's Doctors* (GMC 1993) many universities have reformed their medical curricula. In 1996 The University of Liverpool reformed its medical curriculum from a traditional lecture-based course to an integrated problem-based learning curriculum and included many of the recommendations of *Tomorrow's Doctors* (GMC 1993) (Bradley & Bligh 1999) (Bligh 1995). *Tomorrow's Doctors* highlighted the fact that medical curricula were not adequately preparing graduates to work as PRHOs and part of the rationale for introducing a reformed curriculum in Liverpool was to give graduates greater preparation to work as PRHOs.

Introduction

The consequences of this reform are being closely monitored. This paper follows on from work by Brown *et al* (2004) who have looked at the effects that reform in Liverpool curriculum has had on the attitudes of PRHOs to postgraduate training and papers which have looked at the views of educational supervisors on the competencies of Liverpool PRHOs and curriculum reform (Watmough *et al* (2006 a) (Watmough *et al* 2006 b). Questionnaires were also sent to Liverpool PRHOs asking them to assess their own competencies. The focus of this paper is to examine how well prepared PRHOs from both the Liverpool TMC and RMC felt to work as PRHOs and whether there any differences in the self perceived competencies of graduates from both types of curricula. This article looks at questionnaire data gathered on the last two cohorts to graduate from the traditional medical curriculum (TMC) (1999, 2000) and the first two cohorts to graduate from the reformed medical curriculum (RMC) (2001, 2002).

The Questionnaires

Questionnaires, developed by the University of Manchester (Jones *et al* 2001, Jones *et al* 2002) containing 31 skills, attitudes and competencies from *The New Doctor* (GMC 1997) which the GMC expects graduates to perform as PRHOs were sent to Liverpool PRHOs training in the Mersey Deanery area. The list of graduates and which hospital they were based at was obtained from the Mersey Deanery, the body responsible for postgraduate training in the Liverpool area and the Mersey Deanery is where the vast majority of Liverpool graduates train as PRHOs.

The questionnaires were distributed between the March and June of 2000, 2001, 2002 and 2003 for the 1999, 2000, 2001 and 2002 cohorts respectively, which meant that the PRHOs had experienced both medicine and surgical attachments and were in a position to reflect on their experiences as junior doctors. The questionnaires were originally distributed via the postgraduate centres with stamped addressed envelopes in Mersey Deanery hospitals during PRHO protected teaching time with the help of postgraduate centre staff. Two follow up letters were posted to non-respondents at their hospital addresses.

The PRHOs were asked on the questionnaires, "Please rate yourself on your competency in the following....". The answers were given on a 5-point Likert scale, which ranged from "generally not at all competent" to "generally very competent" with "generally quite competent" as midpoint. The full list of questionnaire variables is included in table one.

Analysis

The questionnaire data were analysed using the Statistical Package for Social Sciences version 11.0 for windows (SPSS) and non-parametric tests (Mann Whitney *U*) have been used to test for significant differences between TMC and RMC cohorts of PRHOs. The results shown in this paper are the average results from the two

traditionally educated traditional cohorts compared with average results from the two cohorts of PRHOs from the RMC.

For the purpose of this paper and ease of presentation the questionnaire results have been summarised in 3 points rather than the 5 points on the Likert scale on the questionnaires. The upper 2 points on the Likert scale have been banded together and are labelled as "more than generally quite competent", the mid point remains the same as "generally quite competent" and the lower two points on the Likert scale have been banded together and labelled as "less than generally quite competent."

Results

The response rates were as follows: 1999, 2000, 2001 and 2002 cohorts respectively were 52% (78/150), 67.5% (112/166), 57% (92/ 161) and 57% (94/162)

The results in table one show the average of the 2 cohorts (1999 and 2000) pertaining to the TMC and 2 cohorts (2001 and 2002) pertaining to the RMC curriculum and the results of the non parametric tests (p= >0.05).

All but two of the 31 questionnaire variables had improved on the midpoint scales when comparing TMC with RMC graduates. Sixteen of the variables had shown a significant difference with only one of these variables ("understanding disease processes") rated in favour of the TMC graduates.

Table one

PRHO ratings on competencies listed in *The New Doctor "Please rate yourselves on your competence in the following"*

Item in order as it appeared on the questionnaire	% of PRHOS rating themselves as (rounded up to nearest whole number) More than quite competent		quite competent		less than quite competent		*P*- value
	TMC	RMC	TMC	RMC	TMC	RMC	(<0.05)
Communicating effectively	80	90	18	9	2	1	ns
Working in a team	79	95	20	4	1	1	0.01
Being aware of limitations	83	91	16	8	1	1	ns
Understanding disease processes	43	33	49	55	8	12	0.018
Managing time effectively	53	63	34	33	13	4	ns
Developing appropriate attitudes towards Personal health and well being	50	66	38	32	12	2	0.001
Recognition of social and emotional Factors in illness and treatment	58	76	36	22	5	2	0.002

	TMC	RMC	TMC	RMC	TMC	RMC	(<0.05)
Providing care for people of different Cultures	49	50	38	42	15	8	ns
Coping with uncertainty	41	33	34	53	25	14	ns
Making the best use of laboratory and Other diagnostic services	44	53	38	40	18	7	ns
Using informatics as a tool in Medical practice	36	50	32	38	32	12	0.002
Understanding the purpose and practice Of audit, peer review and appraisal	34	59	36	32	30	9	0.001
Understanding the relationship between Primary and social care and hospital Care	40	70	40	26	20	4	0.001
Using opportunities for disease prevention And health promotion	36	50	36	41	8	9	0.001
Being aware of legal and ethical issues	27	43	45	49	28	8	0.001
Understanding the principles of evidence Based medicine	42	62	42	35	16	3	0.001
Diagnosis, decision making and the Provision of treatment including Prescribing	48	53	35	35	17	12	ns

	TMC	RMC	TMC	RMC	TMC	RMC	(<0.05)
Keeping accurate records	61	77	35	17	4	5	ns
Obtaining valid consent	47	47	32	37	21	16	ns
Calculating accurate drug dosages	52	69	31	23	17	8	0.004
Writing a prescription	64	77	22	20	14	3	ns
Venepuncture	69	90	23	8	9	2	0.009
Arterial blood sampling	59	81	21	13	21	6	0.001
Suturing	26	43	26	27	48	30	0.001
Performing an electrocardiogram	32	55	23	31	45	14	0.001
Basic Cardio-Pulmonary Resuscitation	71	84	21	13	9	3	ns
Administering oxygen therapy Safely	67	78	21	20	12	3	ns
Correctly using a nebuliser	52	58	17	33	31	9	ns
Inserting a nasogastric tube	43	44	14	32	43	24	ns
Urinary catheterisation	62	67	13	26	25	7	ns
Control of haemorrhage	46	72	33	22	21	7	0.001

TMC = Traditional Medical Curriculum RMC = Reformed Medical Curriculum NS = not significant

Discussion

As the high percentage ratings at midpoint and above demonstrates the PRHOs both from the TMC and RMC rated themselves at generally very competent on the skills listed on the questionnaire. These high percentages may in part be down to the fact that the questionnaires were distributed towards the end of the PRHO year. If they had been delivered earlier in the PRHO year then it may have been possible that the ratings would have been lower when they had less experience as PRHOs.

These results only represent the PRHOs self perception of their skills and as such will be prone to inevitable bias and it may be, given the overall high percentage results that both types of PRHO have over estimated their abilities. Other studies have shown that PRHOs tend to over estimate their own clinical skills (Barnsley *et al* 2004) and that medical students tend to over estimate their own diagnostic skills compared with their supervisors (Mattheos et al 2004). All PRHOs in the UK have named consultant educational supervisors whose job it is to assess their competencies and both TMC and RMC graduate Liverpool PRHOs rated themselves as much more competent in these skills than their consultant supervisors rated them (Watmough *et al* 2006b). Maybe it was to be expected that PRHOs self rating would be higher than the supervisor ratings although as the questionnaires were anonymous the PRHOs would not have felt they were being formally assessed on these skills.

Both TMC and RMC have different experiences of having their skills assessed. Students for the final cohorts of the traditional curriculum undertook traditional final exams at the end of the fifth year. Final year student assessment in the RMC is through portfolios which used similar skills and competencies to those included on the questionnaire so students from the RMC programme may be more used to the process of self evaluation through this process. The PRHOs from the RMC would have been more used to being assessed on those kind of skills listed in the questionnaire. However, all 4 cohorts were subject to portfolio assessment during their PRHO year at the Mersey Deanery which list similar skills to those included on the questionnaire. The ability for health professionals to assess their own competence is a skill that can

be acquired and is crucial for doctors (Mattheos *et al* 2004) and it is possible that PRHOs are still learning this skill.

The response rates were broadly similar for all the PRHO cohorts and while the study may have been improved if higher response rates had been achieved as the numbers for TMC and RMC PRHOs were broadly similar meant that all the cohorts were subject to the same bias. The study reported here has similar response rates to other questionnaire surveys to PRHOs (Jones *et al* 2001, Jones *et al* 2002).

The results and curriculum reform

Despite the generally strong self ratings by both groups of PRHOs and potential for bias in their self ratings there are clear differences in the self perceived competencies between TMC and RMC PRHOs. The results indicate that the RMC PRHOs rate themselves as better prepared for the skills and competencies listed in *The New Doctor* (GMC 1997) than TMC PRHOs and those variables that showed a *significant* change may be explained by differences between both types of curricula.

The RMC is arguably much more geared towards teamwork than the traditional curriculum which could explain the improvement in "working in a team". The students work through the first year in PBL groups where group work makes completing the PBL scenarios more efficient. They also have to gain feedback from nurses when completing the final year portfolio and work closely with other health care professionals in A & E attachments and on GP placements. The improved skills in "using informatics as a tool in medical practice" could also be down to the greater emphasis in the RMC curriculum for finding evidence when working through PBL cases, but also students who have graduated more recently being more accustomed to using computers whether at home or in school.

The RMC graduates feel more competent at "understanding the purpose of audit, peer review and appraisal." Many of the RMC PRHOs will have undertaken audits through their Special Study Modules or on one of the optional final year placements unlike the traditional students who rarely had the opportunity in their course. The actual use of a portfolio in the final year in place of the traditional final exams will have encouraged

students to have a greater awareness of peer review and appraisal. The improvement in "understanding evidence based medicine" can also be related to the final year portfolio where students are assessed on this and of course, gathering evidence is an essential element when working through the PBL scenarios.

Students in the RMC spend approximately 30% of their time on clinical placements in the community compared with four weeks in the TMC which should explain why RMC graduates feel better at "understanding the relationship between primary and social care and hospital care". In general practice undergraduate students learn implicitly about the effects disease has on patients and their family and the increase in community placements may also explain why the RMC graduates rate themselves as better at "recognition of the social and emotional factors in illness and treatment". One of the themes which run through the RMC is "individuals, groups and society" which may also account for this increase in self perception by RMC graduates.

There is a public health aspect in many of the PBL scenarios offering an explanation why RMC graduates feel more competent at "disease prevention and health promotion" and, again this is also an important component of everyday general practice. Another theme which runs through the curriculum is "population perspective" and all students in the RMC curriculum are given copies of GMC documents such as *The New Doctor* (GMC 1997) which stress the importance of this. For "developing appropriate attitudes towards personal health and well being" it is possible that the regular contact with a PBL tutor in the early years of the course and teamwork involved in working through PBL scenarios plays a part. Students from the RMC undertake timetabled discussions and are assessed on "understanding legal and ethical issues" which may explain the increased self perception of ability shown in these results especially as there was little teaching in these areas in the TMC.

Six of the items showing a significant increase relating to practical, clinical skills ('venepuncture', 'control' of haemorrhage', 'performing an ECG', 'suturing', 'arterial blood sampling' and 'calculating accurate drug dosages'). Students are introduced to skills training in the Clinical Skills Resource Centre (Bradley & Bligh 1999) during the first semester. They are assessed on these skills in Objective Structured Clinical Exams (OSCEs) stations throughout the course and in the final year students have to

record how many times they undertake these skills on a clinical skills record sheet within the portfolio. There were no formal practical skills teaching or assessment in the TMC. The clinical exposure in the final year particularly when students "shadow" their first PRHO post for 8 weeks and an 8 week A & E placement that allows students to practice these skills prior to graduation. Students now get the opportunity for supervised writing of patients' notes whilst on the "shadowing" placements which includes updating drug information and have to write drug formulae in the final year portfolio which may also explain why they feel more competent at "calculating accurate drug dosages".

Given that the improvements already mentioned can be linked to curriculum reform it may be something of a surprise that there is no improvement in "communicating effectively" given the introduction of structured communication skills classes in the RMC. In fact the ratings for both groups of PRHOs are very high for this. Focus group research has shown that Liverpool PRHOs feel they are good communicators but for different reasons. The traditional graduates intuitively feel this because doctors naturally have that ability and the RMC graduates because they have received training in that area (Watmough et al 2006 c).

It is concerning that there was a significant decrease relating to "understanding disease processes". Curriculum reform can often lead to uncertainty about knowledge base in graduates (Kaufmann & Mann 1998, Jones *et al* 2002) and elsewhere in the UK PBL graduates (Jones *et al* 2002) have rated themselves as lower regarding understanding disease processes. However, over time it is often found that these concerns are unfounded (Albenese 2000) (Blake *et al* 2000) and the introduction of PBL in Liverpool for dentistry has not affected basic science knowledge (Last *et al* 2001). Focus groups held with the first RMC cohort (Watmough *et al* 2006 d) have shown that these graduates are unsure about basic science due to less structured approach of PBL but do feel they have enough knowledge to work as junior doctors. It is interesting to note that there have been no significant differences and a trend for slight improvements in the other questionnaire variables relating to knowledge on the questionnaire such as "diagnosis, decision making and the provision of treatment including prescribing". Due to the PRHO and student concerns however, changes (yet to be evaluated) have been introduced to the curriculum to support the students in the

acquisition of basic science knowledge within a PBL system through extra plenary sessions and students sharing learning objectives on the University Intranet. With the introduction of the Foundation Programme, Liverpool graduates can be monitored on the management and understanding of disease processes over a 3 year period from the final year of medical school to the end of the F2 using the portfolio system (Watmough *et al* 2006 b) which may lead to further improvements in the acquisition of this knowledge. This may reduce concern over the issue of basic science knowledge. However, further work may be required to look at the impact of some of the changes made to the reformed curriculum and the extra support in place for students to see if this leads to more confidence in knowledge acquisition.

Conclusion

Whether the PRHOs have over estimated their own abilities or not, a picture emerges of PRHOs from the RMC feeling in themselves to be more competent than their predecessors. It has previously been reported that curriculum reform in Liverpool can have a positive impact on how educational supervisors view the competencies of PRHOs and that the supervisors through questionnaires and interviews. In fact the educational supervisors recognised similar improvements in competencies to the PRHOs thus adding to the evidence that curriculum reform can make a difference (Watmough *et al* 2006 a b). One of the reasons for introducing the RMC was to improve preparedness for the PRHO year and this study shows curriculum reform can also have a positive effect on how PRHOs perceive their own competencies.

Acknowledgements

We would like to thank all the PRHOs who took part in this study, the Mersey Region Postgraduate Dean, Dr David Graham for his support during this project and the postgraduate centre managers in the Mersey Deanery for their help distributing questionnaires. We would like to thank Professor Bligh and Joanne Leavis who distributed the questionnaires for the 1999 cohort.

Conflict of interest.

There is no conflict of interest from any of the authors.

References

Albanese, M (2000). Problem-based learning: why curricula are likely to show little effect on knowledge and clinical skills. *Medical Education* 34: 729- 738

Barnsley L, Lyon P, Ralston S, Hibbert E, Cuningham I, Gordon F, Field M (2004) Clinical Skills in junior medical officers: a comparisons of self-reported confidence and observed competence. *Medical Education* **38:** 358-367

Blake R, Hosokawa M., Riley S.L.(2000) Student performances on Step 1 and Step 2 of the United States Medical Licensing Examination following implementation of a problem-based learning curriculum. *Academic Medicine,***75**:66-70.

Bligh J. (1995) Identifying the core curriculum: the Liverpool approach *Medical Teacher,***17**: 383-390

Bradley, P. and Bligh, J.(1999) One years experience with a clinical skills resource centre, *Medical Teacher*, 33, pp.114-120

Brown J, Graham D, Chapman T (2004) Comparison of aspects of pre registration house officer training from traditional and new medical curricula *Hospital Medicine* **65**: 725-747

General Medical Council. (1997) *The new Doctor.* (London, GMC).

General Medical Council (1993) *Tomorrow's Doctors.* (London, GMC)

Jones A, McArdle P, O'Neill P (2001) How well prepared for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Medical Education* **35**: 578-584.
Jones A, McArdle P, O'Neill P (2002) Perceptions of how well graduates are prepared for the role of pre-registration house officer: a comparison of outcomes from a traditional and integrated PBL curriculum *Medical Education* **36**: 16-25.

Kaufman D, Mann K (1998) Comparing achievement on the Medical Council of Canada Qualifying Examination Part I of students in conventional and problem-based learning curricula. *Academic Medicine* **73**:1211-3

Mattheos N, Nattestad A, Falk-Nilsson E, Attstrom R (2004) The interactive examination: assessing students' self-assessment ability. *Medical Education* **38**: 378-389.

Last K, Appleton J, Stevenson H (2001) Basic science knowledge of dental students on conventional and problem-based learning (PBL) courses at Liverpool. *European Journal of Dental Education* **5** :148-154

Watmough S, Taylor D, Garden A, Graham D (in press 2006a) Watmough S, Garden A, Taylor D Educational Supervisors evaluate the preparedness of graduates from a reformed UK curriculum to work as Pre-registration House Officers (PRHOs): A qualitative study. *Medical Education*

.

Watmough S, Ryland I, Garden A, Taylor D (2006b). Educational Supervisors views on the competencies of Preregistration house officers. *Hospital Medicine* **67** : 638-641.

Watmough S, Garden A, Taylor D (in press 2006 c) Does a new integrated PBL curriculum with specific communication skills classes produce Pre-Registration House Officers (PRHOs) with improved communication skills? *Medical Teacher* **28** : 264-269.

Watmough S, Taylor D, Garden A (in press 2006 d) Pre-registration house officers (PRHOs) give their views about studying under a reformed medical curriculum in the UK. *Medical Education*

Key points

PRHOs are able to assess their own competencies according to the expectations of the GMC through questionnaires.

PRHOs rate themselves at more competent than their educational supervisors rate them.

The results show that PRHOs from a reformed medical curriculum rate themselves at more competent on the skills listed in *The New Doctor* than graduates of a traditional course.

These improvements can be linked to reform of the curriculum and the innovations contained in the course.

Curriculum reform can improve graduates self perceptions of preparedness for the PRHO year.

Appendix J conference abstracts

Consultants give their opinions on the competencies of PRHOs and curricula change

ASME conference, Norwich 2002

In 1996 the University of Liverpool radically altered their curricula from a traditional lecture-based course to problem-based learning. The Faculty of Medicine is running an evaluation project to assess whether the new course is delivering competent graduates with the necessary abilities to perform as house officers.

Initially, data has been collected on the final two cohorts of the pre-1996 curriculum. As one part of the evaluation and data collection process interviews were arranged with consultants who supervise Liverpool graduates asking their perceptions of Liverpool PRHOs' competencies and their views on the curriculum change.

Interviews were arranged with 23 educational supervisors across Merseyside hospitals that take the majority of Liverpool graduates as PRHOs and 2 GP surgeries with 11 physicians, 10 surgeons and 2 GPs. The interviews took place in the June and July of 2001, just prior to the first cohort of the new curriculum starting their first house jobs and the last cohort of the pre-1996 curriculum finishing their PRHO year. The interviews lasted between 20 minutes and half an hour. All interviews were recorded, transcribed and coded for analysing purposes.

Overall the consultants' felt that Liverpool graduates were adequately prepared for the role of PRHO although it did seem there was any particularly high expectations. The majority felt that their basic knowledge of anatomy and physiology was good, though there were very mixed opinions of their clinical skills and communication skills. A minority of consultants were against the change to a PBL curriculum in principle and many had problems with the "structure" of the new course but many recognised the Liverpool curriculum was outdated and due for review. Many consultants believed that the new course 5th years had better self-directed learning skills than their counterparts from the pre-1996 curriculum. New developments in the curriculum such as "shadowing" of House Officers and the clinical skills laboratory were seen as positive steps in preparing graduates for being PRHOs. Only a small number of consultants were genuinely worried about the prospective performance of new curriculum graduates as PRHOs.

It is planned to carry out the interviews with as many of the consultants who took part last year as possible in the summer of 2002 to find out how the first cohort of the new curriculum have faired as PRHOs.

Pre registration house officers (PRHOs) assess their undergraduate education through focus groups.

AMEE conference. Lisbon 2002

In 1996 Liverpool University reformed its medical curriculum from a very traditional course to problem-based learning. 4 focus groups from the final cohort of the curriculum were arranged to gain base – line data on how graduates viewed their curriculum. They felt they had been well prepared as PRHOs citing knowledge base as their strong point. They were keen to talk about the new curriculum although they demonstrated they didn't really understand it or its philosophy. They indicated that they would have liked the "shadowing" aspect of the new course and access to the skills lab. Although they felt their education was good they admitted there were deficiencies in their ability to carry out basic clinical skills and they weren't prepared for the "everyday" jobs such as being on call. It is planned to repeat the process with the first cohort of the new curriculum so comparisons can be made.

Consultants give their opinions on the competencies of PBL graduate Pre-Registration House Officers (PRHOs) and curriculum change

ASME conference. Edinburgh 2003

In 1996 the University of Liverpool altered it's curricula from a traditional course to integrated problem-based learning and is running an evaluation project to assess whether the new course is delivering competent PRHOs and views on curriculum change.

Questionnaires used by the University of Manchester (1) based on the competencies expected of graduates by the GMC in *The New Doctor* (1997) with each variable having a 5-point Likert scale were delivered to consultant educational supervisors with a 77% response rate achieved. Interviews took place in the summer of 2002 with 41 consultants who supervise Liverpool graduates asking their perceptions of Liverpool PRHOs' competencies and their views on the curriculum change. Using questionnaires and interviews has allowed qualitative and quantitative data to be cross-referenced and validated.

The interviews and questionnaires showed that the PRHOs had been well prepared for the job and on the questionnaires less than 10% of consultants felt they had not been prepared at all as PRHOs and over 50% very well prepared. They were seen as having good communication skills, have worked well as part of a team, were aware of their limitations and had a good approach to learning and information gathering. The consultants said in the interviews that the PRHOs were adept at performing practical skills although they didn't rate the PRHOs highly on the questionnaires for skills like suturing or inserting a nasogastric tube. From the interviews it was discovered that they only expected their PRHOs to be competent at the more basic skills such as inserting venflons or venepuncture. Regarding their knowledge base just under a quarter felt it wasn't good enough, but generally these were the consultants opposed to a PBL course. The majority felt their knowledge was fine, although some felt the

PRHOs might take longer at their Royal College exams. It emerged that there was little consensus about the knowledge base of the traditional PRHOs and what level was needed when students graduate. Only a minority of consultants were against the change to a PBL curriculum in principle, though many would like some alterations to the structure of the course - however the traditional course was seen as outdated and overdue for reform.

Overall the data has shown that the consultants feel the first cohort have performed well as PRHOs and the change from traditional to PBL course has not had an adverse effect on the quality of Liverpool graduates.

(1) 44. Jones, A *et al* (2001) How well prepared for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Medical Education* 35, 578-584

Pre-Registration House Officers (PRHOs) assess their undergraduate education in a new integrated PBL course through focus groups.

AMEE conference. Berne 2003

In 1996 Liverpool University changed its' curricula from a traditional course to integrated problem-based learning. Five focus groups with 31 PRHOs from the first cohort of the new PBL curriculum were arranged to gather their views on their undergraduate education.

They felt they had been well prepared to be PRHOs, saying that due to certain changes in the course noticeably the clinical skills laboratory, "shadowing" and accident and emergency attachments, they knew how to do the job. They believed they were particularly strong in practical and communication skills, didn't know as much basic science as the old curriculum graduates although this hasn't affected their ability to perform as PRHOs. They had enjoyed their problem-based course and would have preferred this to the traditional course although they wanted more structured teaching such as lectures or tutorials or "directions" in the first couple of years of the course. The analysis from the focus groups can be cross-referenced with questionnaire and interview data.

This paper is a follow up presentation to a paper presented at Lisbon in 2002 looking at the last cohort from the traditional curriculum to graduate from Liverpool.

Does a new integrated PBL curriculum with specific communication skills classes produce Pre Registration House Officers (PRHOs) with improved communication skills?

ASME conference. Liverpool 2004

In 1996 the University of Liverpool reformed the MBChB curriculum from a traditional lecture-based course to integrated problem-based learning. An evaluation

project is underway to assess whether the new course is delivering competent PRHOs. Data has been collected on the first two cohorts from the new curriculum after work was carried out on the last two cohorts of the traditional curriculum allowing for comparisons between traditional and PBL graduates. Three main avenues of data collection have been used: Questionnaires used by the University of Manchester (1) based on the competencies expected of graduates by the GMC in *The New Doctor* (1997) have been sent to educational supervisors and PRHOs. Eighty-two interviews have taken place over a three year period with consultants and GPs who supervise Liverpool graduates asking their perceptions of Liverpool PRHOs' competencies. Four focus groups were held with the last cohort of the traditional curriculum and nine with the first two from the PBL course asking PRHOs to assess their undergraduate education.

The GMC (2) stated there should be increased communication skills training in undergraduate curricula and at Liverpool students are now taught communication skills throughout the course. An important part of evaluating the PBL graduates as PRHOs has looked at their communication skills ability. One questionnaire variable asks the consultants and PRHOs about "communicating effectively". Supervisors and PRHOs were asked specifically about communication skills ability and the communication teaching in the undergraduate curriculum in the interviews and focus groups. The quantitative questionnaire data has revealed a significant increase in the perceived competencies of the PBL graduates in "communicating effectively" from consultants and the PRHOs themselves compared with traditional graduates. The focus groups have shown that PRHOs have different attitudes to communication skills training. The traditional curriculum PRHOs felt they were good communicators despite virtually no formal communication training and that such training was unnecessary as doctors are "natural communicators". The PBL graduates saw the communication skills classes as useful and reflected back on them particularly when dealing with stressful situations. They, unlike their traditionally educated counterparts commented on the failings of their seniors to communicate compassionately. The supervisors have been impressed by the communication skills of the PBL graduates citing it as a real positive from the new course and are impressed by the confidence this gives PRHOs.

This work shows that specific communication skills training can have a positive impact on the communication abilities of PRHOs.

(1) Jones, A *et al* (2001) How well prepared for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Medical Education* 35, 578-584

Consultants give their opinions on the competencies of Problem Based Learning (PBL) graduate Pre- Registration House Officers (PRHOs) and curriculum change

AMEE conference. Edinburgh 2004

In 1996 Liverpool University reformed its curriculum from a traditional course to integrated problem-based learning. An evaluation project is being run to assess whether the new course is delivering competent PRHOs. Part of this project has involved interviewing 41 PRHO educational supervisors to gain qualitative data on how the first cohort (2001 graduates) performed as PRHOs.

They feel the PRHOs have been very well prepared for the job with good communication skills, history and examination skills, were good team workers, aware of their limitations and were adept at clinical skills although it varied which skills they expected PRHOs to undertake. There was a very confusing picture regarding basic knowledge with some consultants expressing concerns, despite saying they had adequate knowledge to be PRHOs. It emerged there was little consensus about the knowledge base of the traditional or PBL graduate PRHOs and what knowledge level was needed at this stage. Although some consultants made suggestions for improving the PBL course the traditional curriculum was seen as outdated and overdue for reform.

Does the introduction of an integrated PBL curriculum produce Pre-Registration House Officers with improved clinical/practical skills? A qualitative study.

ASME conference 2005 Newcastle

In 1996 the University of Liverpool reformed the MBChB curriculum from a traditional lecture-based course to integrated problem-based learning course. The School of Medical Education has been running an evaluation project to assess whether the new curriculum is producing competent house officers. Data has been collected on the first two cohorts from the new curriculum after work was carried out on the last two cohorts of the traditional curriculum allowing for comparisons between traditional and PBL graduates. Eighty-two interviews took place over a three-year period with consultants and GPs who supervise Liverpool graduates asking their perceptions of Liverpool PRHOs' competencies. Four focus groups were held with the last cohort of the traditional curriculum and nine with the first two from the PBL course asking PRHOs to assess their undergraduate education.

Part of the focus groups and interviews has focused on assessing the ability of the PRHOs to undertake practical procedures on patients. The integrated PBL curriculum places a different emphasis on clinical skills training with students introduced to training in a Clinical Skills Resource Centre from the first year. The PBL graduates felt they were very well prepared in this area and there was no practical procedures that they were asked to do as house officers which they hadn't learned as undergraduates. They related their skills to the Resource Centre and the final year A

& E and "shadow placements". For many PRHOs the Clinical Skills Resource Centre was one of the most enjoyable parts of their course.

The graduates from the traditional course felt their practical skills were very varied and there were some procedures they were asked to undertake as PRHOs that they did not practise as students. This was due to the ad hoc training received in this area. They would have liked to have had access to the Clinical Skill Resource centre and believed more structured teaching would have improved their skills. The educational supervisors felt that the PRHOs from the new curriculum were better in this area compared with previous graduates. Until the new curriculum consultants didn't have particularly high expectations about ability of their house officers regarding practical procedures. Many of the supervisors felt that having improved clinical/practical skills eased the transition from student to junior doctor.

This work shows that reform of the medical curriculum can lead to an improvement in the ability of PRHOs to perform practical procedures on patients.

Perceptions of Pre-Registration House Officers (PRHOs) and their Supervisors to the introduction of Community-based Problem-Based Learning (PBL) education

AMEE Conference 2005, Amsterdam

In 1996 Liverpool reformed its medical curriculum from traditional to integrated PBL. Community attachments were significantly increased and now account for approximately 30% of undergraduate clinical placements.

We formed focus groups with graduates to ask their views on their undergraduate GP placements. They felt there was too much community teaching in their course and they were being "forced to become GPs. However they felt the community placements were useful preparation for hospital work noting that PRHOs usually deal with minor ailments on the ward. General Practice was a good place to practice communication and they enjoyed the one- one interactions with patients.

GP PRHO rotations began in Mersey in 2000. When this work was carried out GPs had supervised 2 cohorts of Liverpool graduates. We sent questionnaires and held interviews with these GPs. They were very positive about the PRHOs who were seen as having good communication and referral skills, understood disease processes, took a good history and examination and were good problem-solvers. They welcomed the introduction of the new curriculum and in particular the increase in community teaching, although none of the GPs were particularly "evangelical" about community placements believing that GP surgeries require further funding to supervise students and PRHOs.

References

Agar, M., Macdonald, J. (1995) Focus groups and ethnography. *Human Organisation*, **54**,78-86.

Ajzen, I. (1996) The directive influence of attitudes on behaviour. In Gollwitzer, P., & Bargh, J. (eds.), *The Psychology of Action: Linking Motivation and Cognition to behaviour*, 385-403. New York: Guilford.

Albanese, M., Mitchell, S. (1993) Problem-based learning: a review of literature on its outcomes and implementation issues. *Academic Medicine*, **68**, 52-81.

Albanese, M. (2000) Problem-based learning: why curricula are likely to show little effect on knowledge and clinical skills *Medical Education*, **34**, 729.

Al-Damegh, S., Baig, L. (2005) Comparison of an integrated problem-based learning curriculum with the traditional discipline-based curriculum in KSA. *Journal of the College of Physicians and Surgery Pakistan*, **15**, 605-8.

Alleyne, T., Shirley, A., Bennett, C., Addae, J., Walrond, E., West, S. (2002) Problem-based compared with traditional methods at the faculty of medical sciences, University of the West Indies: a model study. *Medical Teacher*, **24**, 273-9.

Anon. (1977) *Basic Medical Education in the British Isles. The Report of the General Medical Council survey. In the United Kingdom and Republic of Ireland, 1975-6 1. General Section and School Profiles.* London: Nuffield Provincial Hospitals Trust.

Anon. (1988) The Edinburgh Declaration. *Medical Education*, **22**, 481-487

Anon. (1992) Doctor and Hospital medical education and training survey. *Doctor*, 1992, **1**, 27.

Anon. (1994) World Federation for Medical Education. Proceedings of the World Summit on Medical Education. *Medical Education*, **28** (supplement 1).

Anon. (1997) Descriptions of Undergraduate Medical Courses in the UK. Conference Papers, Innovations in Undergraduate medical education. Edinburgh: ASME.

Antepohl, W., Domeij, E., Forsberg, P., Ludvigsson, J. (2003) A follow up of medical graduates of a problem-based learning curriculum. *Medical Education*, **37**,155-162.

Armstrong, J., Lusk, E. (1987) Return postage in mail surveys: a meta-analysis, *Public Opinion Q.*, **51**, 233–48.

Baig, L. (2006) Problem based learning in medical education: theory, rationale, process and implications for Pakistan. *Journal of the College of Physicians and Surgeons, Pakistan*, **16**, 608-613.

Baig, L., Assad, F. (2003) Introducing problem-based learning in a medical school with a traditional/conventional curriculum. *Journal of the College of Physicians and Surgeons, Pakistan*, **13**, 378-81.

Barbour, R. (1995). Using focus groups in general practice research. *Family practice*, **12**, 328-34.

Barbour R, & Kitzinger, J. (1999) *Developing Focus Group Research: Policy, theory and Practice.* London: Sage.

Barnsley, L., Lyon, P., Ralston, S., Hibbert, E., Cunningham, I., Gordon, F., Field, M. (2004). Clinical skills in junior medical officers: a comparison of self-reported confidence and observed competence. *Medical Education*, **34**, 358–367.

Barrows, H. (1986) A taxonomy of problem-based learning methods. *Medical Education*, **20**, 481-486.

Barrows, H. & Tamlyn, R. (1980) *Problem-based learning.* New York: Springer Publishing.

Berkson, L. (1993). Problem-based learning: have the expectations been met? *Academic Medicine*, **68**, (10 Supplement) S79-88.

Berry, A. (2003). EU working time directive. More doctors is truly not the answer. *British Medical Association.* **326**, 329-330.

Bhattacharya, N. (1998) Students perceptions of problem-based learning at the BP Koirala Institute of Health Sciences. *Medical Education*, **32**, 407 – 410.

Blake, J., Norman G., Kinsey, E., Smith, M. (1995) Report card from McMaster: student evaluation at a problem-based medical school. *Lancet*, **345**, 899-902.

Blake, R., Hosokawa, M., Rile, S. (2000) Student performances on step 1 and step 2 of the United States Medical Licensing Examination following the implementation of a problem-based learning curriculum. *Academic Medicine*, **75**, 66-70.

Blaikie, N. (2003) *Analysing Quantitative Data.* London: Sage Publications.

Bligh, J. (1994) *Factors influencing Learning in General Practice*. M.D. University of Liverpool.

Bligh, J. (1995) Identifying the core curriculum: the Liverpool approach. *Medical Teacher*, **17**, 383-390.

Bligh, J., Parsell, G. (1995) The changing context of undergraduate medical education. *Postgraduate Medical Journal*, **71**, 394-403.

Blumberg, M. (1992). Development of self directed Learning Behaviours in Partially teacher directed problem-based learning curriculum. *Teaching and Learning Medicine*, **4**, 3-8.

Bogg, J., Gibbs, T., Bundred, P. (2001) Training, job demands and mental health of pre-registration house officers *Medical Education*, **35**, 590-595.

Boshuizen, H., Schmidt, H., Wassamer, I. (1990) Curriculum style and the integration of biomedical and clinical knowledge. Proceedings of the Second International Symposium on Problem based learning. Yokyakarta Indonesia.

Bradley, P., Bligh, J. (1999) One year's experience with a clinical skills resource centre. *Medical Education*, **33**, 114-120.

Bradley P., Bligh, J. (2005) Clinical Skills Centres: Where are we going? *Medical Education*, **39**, 649–650.

British Medical Association (2004) *BMA cohort study of 1995. Ninth Report June 2004*. London: BMA.

Britten, N (1995) Qualitative research; Qualitative interviews in medical research. *British Medical Journal*, **311**, 251-253.

Brown, J., Graham, D., Chapman, T., (2003). Factors influencing teaching and learning in the pre registration year. *British Journal of Hospital Medicine*, **64**, 740-742.

Brown, J., Ryland, I., Graham, D., Chapman T., (2004) Comparison of aspects of pre registration house officer training from traditional and new medical curricula. *British Journal of Hospital Medicine*, **65**, 725-27.

Brown, J. (2005) *From student to professional: a case study of the teaching and learning environment during a formative transitional period in the career of new doctors.* Unpublished PhD Thesis. Lancaster: University of Lancaster.

Brown, S., King, B. (2000) Constructivist Pedagogy and How We Learn: Educational Psychology Meets International Studies. *International Studies Perspectives*, **1**, 245-254.

Bryman, A., Cramer, D. (1990) *Qualitative Research for Social Scientists.* London: WB Saunders.

Bullimore, D. 1998. *Study skills and Tomorrow's Doctors.* London: WB Saunders.

Buckley, G. (1998) Partial truths: research papers in medical education. *Medical Education*, **32**,1-2.

Burch, V., Nash, R., Zabow, T., Gibbs, T., Aubin, L., Jacobs, B., Hift, R. (2005) A structured assessment of newly qualified medical graduates. *Medical Education*, **39**, 723–731.

Burns, R. (2000). *Introduction to Research Methods*. California: Sage; Thousand Oaks.

Calman, K., Donaldson, M. (1991) The pre-registration year: a critical incident study. *Medical Education*, **25**, 51-59.

Cantwell, B., Ramirez, A. (1997) Doctor-patient communication: a study of junior house officers. *Medical Education* **31**, 17-91.

Carney, T. (1990). *Collaborative inquiry methodology*. Windsor, Ontario Canada: University of Windsor, Division for Instructional Development.

Chamberlain, M. (2001) *Shaping the Medical Workforce – A blending of service & Education*. Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

Chamberlain, T. (1965) The Method of Multiple Working Hypotheses. *Science*, **148**, 745-9.

Chelimsky, E. (1995) Comments on the guiding principle. In Radish, W., Newman, D., Scheirer, M, Wye, C. (Eds) *Guiding principles for evaluators*. New Directions for Programme Evaluation. **66**, 55-54. San Francisco: Jossey-Bass.

Chhon-Huat Koh, G., Khoo, H., Wong, M., Koh, D. (2008) The effects of problem-based learning during medical school on physician competency: a systematic review. *Canadian Medical Association Journal*, **178**, 34-41.

Christopher, F. (2002) The new edition of Tomorrow's Doctors. *Proceedings of the ASME annual conference UEA, Norwich, 2002.*

Clack, G. (1994) Medical graduates evaluate the effectiveness of their education. *Medical Education*, **28,** 418-43.

Claessen, H., Boshuizen, H. (1985) Recall of Medical information by students and doctors. *Medical Education*, **19**, 61-67.

Cohen-Scotanus., J, Reindeers, J., Moleanaar, W. (2004) Reflections of graduates: differences between traditional and PBL curricula. *Proceedings of the AMEE conference, Edinburgh 2004.*

Colliver J., Robbs, S. (1999) Evaluating the Effectiveness of Major Educational Interventions. *Academic Medicine*, **74**, 859-860.

Colliver, J. (2000) Effectiveness of problem-based learning curricula. *Academic Medicine*, **75**, 259-66.

Cook, T. (1985) Post positivist critical multiplism. In Shotland, R., Mark, M. (Eds.) *Social science and social policy.* Beverly Hills, California: Sage.

Cook, T., Reichardt, C. (Eds.) (1979) *Qualitative and quantitative methods in evaluation research.* Beverly Hills, California: Sage.

Coulson, R. (1983) Problem-based Student Learning of the Cardiovascular System using the Problem-Based Learning Module. (P.B.L.M.), *Physiologist*, **26**, 220-224.

Corston, R., Colman, A. (2003) A *crash course in SPSS for windows versions 10 and 11.* Oxford: Blackwell.

Cronbach, L. (1982). *Designing evaluations of educational and social programs.* San Francisco: Jossey-Blass.

Cunnington, J., Norman, G., Blake, B. (1996) Applying learning taxonomies to test items: Is a fact an artefact? *Academic Medicine*, **71**, S55-S66.

Dahle, L., Brynhildsen, J., Fallsberg, M, Rundquist, I (2002) Pros and cons of vertical integration between clinical medicine and basic science within a problem-based undergraduate medical curriculum: examples and experiences from Linköping, Sweden. *Medical Teacher*, **24**, 280-285.

Datta, L. (1995). Multimedia evaluations: A landscape with case studies. *Proceedings of the International Evaluation Conference, Vancouver, Canada 1995.*

Davis, W., Nairn, R., Paine, M., Anderson, R. (1992). Effects of expert and non expert Facilitators on the Small Group Process. *Academic Medicine*, **67**, 470-474.

Davis, M., Harden, R. (1999) AMEE Medical Education Guide No. 15: Problem-based learning: a practical guide. *Medical Teacher,* 21, 130-140.

Dean, S., Barratt, A., Hendry, G., Lyon, P. (2003) Preparedness for hospital practice among graduates of a problem-based, graduate-entry medical program *Medical Journal of Australia*, **178**, 163-166.

Denzin., N. & Lincoln, Y (Eds.) (1994). *Handbook of qualitative research.* Thousand Oaks, California: Sage.

Department of Health (2000) *The NHS Plan. A plan for investment. A plan for reform.* London: HMSO.

Department of Health (2003) *Delivering the NHS Plan – Expenditure Report* London: HMSO.

Department of Health (2004) *Modernising Medical Careers: the next steps.* London: HMSO.

Dewey, J. (1911). *How we think.* New York: Prometheus books.

Dewey, J. (1916). *Democracy and Education.* New York: Macmillan.

Doherty, E., O'Boyle, C., Shannon, W., McGee H., Bury G. (1991) Communications skills training in undergraduate medicine, *Irish Medical Journal,* **83**, 54-6.

Dolmans, D., Schmidt, H. (1994) What drives the student in problem-based learning? *Medical Education*, **28**, 372-380

Dolmans, D., De Grave, W., Wolfhagen, I., Van der Vleuten, C. (2005). Problem-based learning: future challenges for educational research and practice. *Medical Education*. 39, 732-741.

Dressien, E., Tartwijk J., Vermont, J. & Van der Vleuton, C. (2003). Use of portfolios in early undergraduate medical education. *Medical Teacher*, **25**, 18-23.

DuBoulay, C., Medway, M. (1999) The clinical skills resource: a review of current practice. *Medical Education*, **33**, 185–191.

Duerson M., Romrell, J. (2000) Impacting Faculty Teaching and Student Performance: Nine Years' Experience With the Objective Structured Clinical Examinations. *Teaching and Learning in Medicine*, **12**, 176-182.

Dumelow, C., LittleJohns, P., Griffiths, G. (2000) Relation between a career and family life for English hospital consultants; a qualitative semi structured interviews study. *British Medical Journal*, **320**, 1437-1440.

Edwards (1991) *Evaluation in adult and further education*. Liverpool: Wirral Education Authority.

Eisenstadt, R., Barry., W., Glanz, K. (1990) Problem-based Learning: Cognitive Retention and Cohort Traits of Randomly selected Participants and Decliners. *In* Research in medical education. *Academic Medicine*, **65**, Supplement (September)L: S11-S12.

Enarson, C., Cariaga-Lo, L. (2003) Influence of curriculum type on student performance in the United States Medical Licensing Examination Step 1 and Step 2 exams: problem-based learning vs. lecture-based curriculum. *Medical Education*, **35**, 1050-1055.

Eva, K. & Rehegr, G. (2005) Self-Assessment in the Health Professions: A Reformation and Research Agenda. *Academic Medicine.* **80** , Supplement number 10.

Evans., J., Lee, P., Goldacre, M., Lambert, T. (2004) Pre-registration house officers' comments on working in the NHS: a qualitative study of the views of UK medical graduates of 1999. *Medical Teacher,* **26**, 250-255.

Farrah, K. (2002) Time to review prescribing in hospitals by pre-registration house officers. *The Pharmaceutical Journal,* **268**, 136.

Fewtrell, R. (2007). *The portfolio evaluation in MbCHb curriculum.* (Progress report). Liverpool: University of Liverpool. Unpublished Report.

Finucane, P., Johnson, S., Prideaux, D. (1998) Problem-based learning: its rationale and efficacy. *Medical Journal Australia*, **168**, 445-448.

Firestone, W. (1987) Meaning in method: The rhetoric of qualitative and quantitative research. *Educational Researcher*, **16**, 16-21.

Fishbein, M., Ajzen, I. (1974) Attitudes towards objects as predictors of single and multiple behavioural criteria. *Psychological Review*, **81**, 59-74.

Flexner, A. (1925). *Medical Education: a comparative study.* New York: MacMillan.

Fox, R., Ingham Clark, C., Scotland, A., Dacre, J. (2000) A study of pre-registration house officers' clinical skills. *Medical Education*, **34**, 1007-1012.

Foltz, D., Hazlett, J. (1991) Public participation and recycling performance: explaining programme success. *Public Administration Review*, **51**, 526-535

Frankland, J., Bloor, M. (2001) *Some issues arising in the systematic analysis of focus group materials.* In: Barbour, R, Kitzinger, J. *Developing Focus Group Research. Politics, theory and Practice.* London: Sage.

Fraser, R. (1991) Undergraduate Medical Education: present state and future needs. *British Medical Journal*, **303**, 41-43.

Frazer, L., Lawley, M (2000) *Questionnaire design & administration.* Australia: John Wile & Sons.

Freeman, H., Klein, R. Townsend, J., Lechtig, A. (1980) Nutrition and cognitive development among rural Guatemalan children. *American Journal of Public Health*, **70**, 1277-1285.

Friedman Ben David, M., Snadden, D., Hesketh, A. (2004) Linking appraisal of PRHO professional competence of junior doctors to their education. *Medical Teacher*, **26**, 63-70.

Fyrenius, A., Bergdahl, B., Silen, C. (2005) Lectures in problem-based learning – Why, when and how? An example of interactive lecturing that stimulates meaningful learning. *Medical Teacher*, **27**, 61-65.

Ginsburg, S., Kachan, N., Lingard, L. (2005) Before the White Coat: perceptions of professional lapses in the pre-clerkship. *Medical Education*, **39**, 12-19

Glew, R. (2003) The Problem with Problem-based Medical Education Promises Not Kept. *Biochemistry and Molecular Biology Education*, **31**, 52-56.

GMC (1957) *Recommendations on Basic Medical Education*. London: GMC.

GMC (1967) *Recommendations on Basic Medical Education*. London: GMC.

GMC (1991) *Undergraduate Medical Education, the need for change*. London: GMC.

GMC. (1993) *Tomorrow's Doctors: recommendations on undergraduate medical education* London: GMC.

GMC (1997). *The New Doctor.* London: GMC.

GMC (1999) *Report of the visit to the Faculty of Medicine and The Mersey Deanery, The University of Liverpool.* 25-26 October 1999. London: GMC.

GMC (2002) *Tomorrow's Doctors.* London: GMC.

GMC (2005) *The New Doctor.* London: GMC.

GMC (2006) How could UK graduates be better prepared for practice? http://www.gmc-uk.org/education/itt_doctor/index.asp accessed May 9th 2006. London: GMC.

Goldacre, M., Turner, G., Lambert, T. (2004) Variation by medical school in career choices of UK graduates of 1999. *Medical Education*, **38**, 49-258.

Goodenough, W. (1944) *Great Britain, Ministry of Health and Department of Health for Scotland. Report of the inter*-departmental committee on medical schools. *(Chairman: Sir William Goodenough).* London: HMSO.

Goody, E. (ed.) (1982) *From Craft to Industry.* Cambridge: Cambridge University Press.

Gray, T. (2003) *Founder of the Liverpool Medical School Dr Richard Formby* London: Royal College of Physicians.

Gray, T., Sheard, S. (2001). *A Brief History of Medical Education in Liverpool.* Liverpool: University of Liverpool.

Green, M., Ellis, C., Fremont, P., Batty, H. (1998) Faculty evaluation in Departments of Family Medicine: do our universities measure up? *Medical Education*, **32**, 597-606.

Green, J., Caracelli, V., Graham, W. (1989). Toward a conceptual framework for mixed – method evaluation designs. *Educational Evaluation and Policy analysis*, **11**, 255- 274.

Griffiths, R., James, D. (2000) *The New Curriculum Phase 3.* Liverpool: University of Liverpool Unpublished internal report.

Groves, M. (2005) Problem-Based Learning and Learning Approach: Is There a Relationship? *Advances in Health Sciences Education*, **10**, 315-326.

Guba, E., Lincoln, Y. (1981) *Effective Evaluation.* San Fransisco: Jossey-Bass.

Gurpinar E., Musal, B., Aksakoglu G., Ucku, R. (2005) Comparison of knowledge scores of medical students in problem-based learning and traditional curriculum on public health topics *BMC Medical Education*, **5**, 7.

Hampshire, A. (1998) Providing early clinical experience in primary care. *Medical Education*, **32**, 497-501.

Hannon, F. (2000) A national medical education needs' assessment of interns and the development of an intern education and training programme. *Medical Education*, **34**, 275-284.

Harden, R., Sowden, S., Dunn, W. (1984) Some educational strategies in curriculum development: the SPICES model. ASME Medical Education booklet no. 18 *Medical Education*, **18**, 284-97.

Hay, P., Katskitis, M. (2001) The "expert" in problem-based and case-based learning: necessary or not? *Medical Education*, **35**, 22-26.

Heenan, A. (1991) Working with doctors. Uneasy partnership. *Nursing Times*, **87**, 25-27

Hendry, R., Kawai, Moody,G., Sheppard, J., Smith,. L. Richardson, M., Mathers, J., Parry, J. (2005) Consultant attitudes to undertaking undergraduate teaching duties: perspectives from hospitals serving a large medical school. *Medical Education*, **39**, 1129–1139.

Hill, J., Rolfe, I., Pearson, S., Heathcote, H. (1998) Do junior doctors feel they are prepared for hospital practice? A study of graduates from traditional and non-traditional medical schools. *Medical Education*, **32**, 19-24.

Howe, A., Ives, G. (2001) Does community-based experience alter career preference? New evidence from a prospective longitudinal cohort study undergraduate medical students. *Medical Education*, **35**, 391-97.

Howe, A. (2001) Patient-centred medicine through student-centred teaching: a student perspective on the key impacts of community- based learning in undergraduate medical education. *Medical Education*, **35**, 666-672.

Howe, K. (1988) Against the quantitative-qualitative incompatibility thesis, or dogmas die hard. *Educational Researcher*, **17**, 10 – 16.

Hutchinson, L. (1999) Evaluating and researching the effectiveness of educational interventions. *British Medical Journal*, **318**, 1267-1269.

Hyppola, H., Kumpusalo, E., Virjo, I., Mattilo K., Neittaanmaki L., Halila., Kujala S., Luhtala., Isokoski, M. (1996) Where should special attention be paid in undergraduate medical education? Two surveys among Finish doctors." *Medical Education*, **30**, 31-37.

Hyppola, H., Kumpusalo, E., Virjo, I., Mattilo, K., Neittaanmaki, L., Halila., Kujala S., Luhtala., Isokoski, M. (2000) Evaluation of undergraduate medical education in Finnish community-oriented and traditional medical faculties: a 10-year follow-up. *Medical Education*, 34, 1016-1018.

Hyppola, H., Kumpusalo, E., Virjo, I., Mattilo, K., Neittaanmaki, L., Halila., Kujala, S., Luhtala., Isokoski, M. (2002) Improvement in undergraduate medical education: a 10-year follow up in Finland. *Medical Teacher*, **24**, 52-56.

Illing, J., Taylor, G., Van Zwanenberg, T. (1999) A qualitative study of pre-registration house officers in general practice. *Medical Education*, **33**, 894-900.

Illing, J., Van Zwanenberg, Cunningham W, Taylor, G., O'Halloran, C., Prescott, R. (2003). Preregistration house officers in general practice: a review of evidence. *BMJ*, **326**,1019 -1022.

Irvine, D. (1993) General Practice in the 1990s: a personal view on future developments. *British Journal of General Practice*, **43**, 121-125.

Issenberg, S., McGaghie, W. (2002) Clinical skills training – practice makes perfect. *Medical Education*, **36**, 210-211.

Jamieson, J. (2004) Likert scales: how to (ab)use them. *Medical Education*, **38**, 1212-1218.

Johnson, J., Reynard, K. (1994) Assessment of an objective structured clinical examination (OSCE) for undergraduate students in accident and emergency medicine. *Journal of Accident and Emergency Medicine*, **11**, 223-226.

Jones, A. O'Neill, P., McArdle, P. 2001. How well prepared for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Medical Education*, **35**, 578-584.

Jones, A., O'Neill P., McArdle, P. (2002) Perceptions of how well graduates are prepared for the role of pre-registration house officer: a comparison of outcomes from a traditional and integrated PBL curriculum. *Medical Education* **36**, 16-25.

Jones, A. (2003) *Comparison of the outcomes of a traditional and an innovative medical curriculum. Manchester* : University of Manchester. Unpublished PhD thesis.

Jones, A., Willis, S., McArdle, P., O'Neill, P. (2006) Learning the house officer role: reflections on the value of shadowing a PRHO. *Medical Teacher*, **28**, 291 – 293.

Katona, G. (1940) *Organizing and Memorizing: Studies in the Psychology of Learning and Teaching*, New York: Colombia University press.

Kauffman, D., Mann., K. (1996). Comparing Student's attitudes in problem-based and conventional curricula. *Academic Medicine*, **73**, 1096-1099.

Kaufman, D., Mann, K. (1997) Basic sciences in problem-based learning and conventional curricula: students' attitudes. *Medical Education*, **31**, 177-180.

Kaufman, D., Mann, K. (1998). Comparing achievement on the Medical Council of Canada Qualifying Examination Part I of students in conventional and problem-based learning curricula. *Academic Medicine*, **74**, 853-858.

Kaufman, D., Mann, K. (1999). Achievement of Students in a Conventional and Problem-Based Learning (PBL) Curriculum. *Academic Medicine*, **4**, 245 – 260.

Khan, I., Fareed, A. (2000) Problem-based learning variant: transition phase for a large institution. *Journal of the Pakistani Medical Association*, **51**, 271-14.

Kidder, L., Fine, M. (1987) Qualitative and quantitative: when stories converge. In Mark, M., Shotland, R. (Eds.), *Multiple methods in program evaluation. New Directions for Program Evaluation,* San Francisco : Jossey-Bass.

Kiessling, C., Schubert, B., Scheffner, D., Burger, W. (2004) First year medical student's perception of stress and support: a comparison between reformed and traditional track curricula. *Medical Education*, **38**, 504-09.

Kirk, J., Miller, M. (1986) *Reliability and validity in qualitative research.* Newbury park, California: Sage.

Kirkpatrick, D. (1975). *Evaluating Training Programmes.* Madison : American Society for training and development.

Kitzinger, J. (1995) Introducing Focus Groups. *British Medical Journal*, **311**,299-302.

Knapp, T. (1990) Treating ordinal scales as interval scales: an attempt to resolve the controversy. *Nurse Research*, **39**, 121-3.

Knowles, M. 1975. *Self-directed learning A guide for learners and teachers.* Chicago: Association Press, Follet Publishing Company.

Krueger, R. (1997) *Analysing and reporting focus group results.* California: Sage.

Kuhnigk, O., Haufs C., Strebel, B., & Bullinger, M. (2004). Attitudes of medical students to Psychiatry in a PBL program and a traditional program – a comparison. *Proceedings of the AMEE annual conference Edinburgh 2004.*

Kvale, S. (1994). *Interviews. An Introduction to Qualitative Research Interviewing.* Thousand Oaks, California: Sage.

Lambert, T. Goldacre, M., Evans, J. (2000) Views of junior doctors about their work: survey of qualifiers of 1993 and 1996 *Medical Education*, **34** 374-84.

Lambert, T., Goldacre, M., & Turner, M. (2006) Career choices of United Kingdom medical graduates of 2002: questionnaire survey. *Medical Education*, **40**, 514-21.

Last, K., Appleton, J., Stevenson, H. (2000) The value of a questionnaire in assessing the acquisition and retention of basic science knowledge by Dental Students. *European Journal of Dental Education*, **4**, 3-9.

Last, K., Appleton, J., Stevenson, H. (2001) Basic science knowledge of dental students on conventional and problem-based learning (PBL) courses at Liverpool. *European Journal of Dental Education*, **5**, 148-154.

Lave, J. & Wenger, E. (1991) *Situated Learning. Legitimate peripheral participation*, Cambridge: University of Cambridge.

Lave, J. & Wenger, E. (2002) *Supporting lifelong learning: perspectives on learning.* In Supporting lifelong learning Harrison, R., Reeve, F., Hanson, A, Clarke, J. (eds.) London: Open University.

Leinster, S. (2003) Standards in medical education in the European Union. *Medical Teacher*, **5**, 507–509.

Lempp, H., Seabrook, M., Cochrane, M., Rees, J. (2004) The transition from medical student to doctor: perceptions of final year students and pre-registration house officers related to expected learning outcomes. *International Journal of Clinical Practice*. **59**, 324 – 329.

Lempp, H., Cochrane, M., Rees, J. (2005). A qualitative study of the perceptions and experiences of Pre-Registration House Officers on teamwork and support. *BMC Medical Education*, **5**, 10.

Lloyd Jones, G. (2002) *A multiple case study of the first year student perspective in a medical undergraduate PBL curriculum* . University of Liverpool. Unpublished PhD Thesis

Lloyd Jones, G., Hak, T. (2004) Self-Directed Learning and Student Pragmatism. *Advances in Health Sciences Education*, **9**, 61-73.

Likert, R. (1932). *A technique for measuring attitudes*. New York: Colombia.

Lincoln, Y., Guba, E. (1994) Rsvp: We are pleased to accept your invitation. *Evaluation Practice*, **13**, 179-192.

Lowry, S. (1992) What's wrong with medical education in Britain? *British Medical Journal* , **305**, 1277-80.

MacLachlan, J., Patten, D. (2006). Anatomy teaching: ghosts of the past, present and future. *Medical Education*, **40**, 243-53.

Mahoney, R., Katona, C., McParland, M., Noble, L. Livingston, G. (2004) Shortage specialties: changes in career intentions from medical student to newly qualified doctor. *Medical Teacher*, **26**, 650-654.

Mamede. S., Schmidt, H., Norman, G. (2006) Innovations in Problem-based Learning: What can we Learn from Recent Studies? *Advances in Health Sciences Education*, **11**, 403- 422.

Mann, K., Kauffmann, D. (1999) A comparative study of problem-based and conventional undergraduate curricula in preparing students for graduate medical education. *Academic Medicine* , **74**, S4 – S6.

Mark, M. & Shotland, R. (1987). Alternative models for the use of multiple methods. In Mark, M. & Shotland, R (Eds.) *Multiple Methods in program evaluation. New Directions for Program Evaluation.* San Francisco: Jossey-Bass.

Mattheos, N., Nattestad, A., Falk-Nilsson E., Attstrom, R. (2004) The interactive examination: assessing students' self-assessment ability *Medical Education*, **38**, 378-389.

Maudsley, G. (1999) Do we all mean the same thing by problem-based learning? A review of the concepts and a formulation of ground rules. *Academic Medicine* , **74** 178-185.

Maudsley, G., Strivens, J. (2000) Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education*, **34**, 535-544.

Maudsley, G. (2001) How do medical students characterise good problem based learning (PBL) tutoring after a year's experience. Proceedings of the AMEE conference 2001, Berlin.

Maudsley, G. 2003. The limits of tutors' comfort zones with four integrated knowledge themes in a problem-based undergraduate medical curriculum (Interview study). *Medical Education*, **37**, 417-423.

McKeown, P., Heylings, D., Stevenson, M., McKelvey, K., Nixon, J., McCluskey, D. (2003) The impact of curricular change on medical students' knowledge of anatomy *Medical Education*, **37**, 954 – 96.

McLean, M. (2003) Communicating curriculum reform to students: Advice in hindsight..... *BMC Medical Education*, **3**, 4.

Merrison Report (1975). *Report of the Committee of Inquiry into the Regulation of the Medical Profession,* Cmnd. 6018. London: HMSO.

Michel, M., Bischoff, A., zu Heringdorf, D., Neumann, D., Jakobs, K. (2002) Problem vs. lecture-based pharmacology teaching in a German medical school. *Naunyan Schmiedebergs Arch Pharmacology,* **366**, 64-68.

Miflin, B., Campell, C., Price, D. (1999) A lesson from the introduction of a problem-based, graduate entry course: the effects of different views of self-direction. *Medical Education* , **33**, 801-807.

Miles, M., Huberman, M. (1994) *Qualitative data analysis: an expanded sourcebook.* 2nd Edition. California: Sage.

Moffat, K., McConnachie, A., Ross S., Morrison, J. (2004) First year medical students' stress and coping in problem-based learning medical curriculum. *Medical Education*, **38**, 482-91.

Moore, G., Block, S. Mitchell, R. (1990) *A randomised Controlled Trial Evaluating the impact of the New York Pathway Curriculum at Harvard Medical School.* Report to the fund to the improvement of Post-secondary education (Unpublished report). Cambridge: Massachusetts Harvard Medical School.

Molloy, M (2003). EU working time directive. Directive will be biggest driver for change in delivery of medical care. *British Medical Journal*, **326**, 68.

Moore, G., Block, S., Mitchel, R.1990. A randomised Controlled Trial Evaluating the impact of the New York Pathway Curriculum at Harvard Medical School. Report to the fund to the improvement of Post-secondary education (Unpub). Cambridge: Massachusetts Harvard Medical School.

Moore-West, M., O'Donnell, M. (1985) Programme Evaluation in *Implementing Problem-based Medical Education: Lessons from Successful Innovations.* Kaufman, A. New York: Springer.

Moran, R (1991) Working with doctors. Different priorities. *Nursing Times*, **87**, 35-37.

Morgan, D. (1993) *Successful focus groups. Advancing the state of the art.* California: Newbury Park.

Morgan, D. (1997) *Focus Groups as Qualitative Research.* London: Sage.

Morgan, D., Krueger, R. (1993) When to use focus groups and why in Morgan, D. (Eds.) *Successful focus groups: Advancing the State of the Art.* London: Sage.

Murray, E., Jolly, B. Modell, M. (1997) Can students learn clinical method in general practice? A randomised crossover trial based on objective structured clinical examinations. *British Medical Journal*, **315**, 920-923.

Nandi. P., Chan, J., Chan, C., Chan, P., Chan, L. (2000) Undergraduate medical education: a comparison of problem-based learning and conventional teaching. *Hong Kong Medical* Journal, **6**, 301-306.

Newman, M. (2004) *Problem-based learning: An exploration of the method and evaluation of its effectiveness in a continuing nurse education programme.* London: University of Middlesex.

Newman, M. (2006) Establishing Problem-based learning: the case for a fitness for purpose approach to study design. *Advances in Health Sciences Education*, **11**, 391-402.

Neufeld, V. Barrows, H. (1974) The McMaster Philosophy: an approach to medical education. *Journal of Medical Education*, **49**, 1040-50.

Nuefield, V., Woodward, C., Macleod, S.(1989) The McMaster MD program; a case study of Renewal in Medical Education. *Academic Medicine*, **64**, 423 –432.

Nolte, J., Eller, P., Ringer, S. (1988) Shifting toward Problem-based learning in Medical School Neurobiology Course. *Research in medical education. Proceedings of the 27th Annual Conference*. Association of the Medical Colleges.

Norman, G., Schmidt, H. (1992) The psychological basis of Problem-based learning: A Review of the Evidence. *Academic Medicine*, **67**, 557-565.

Norman, G., Schmidt, H. (2000) Effectiveness of problem-based learning curricula: theory, practice and paper darts. *Medical Education*, **34** , 721 – 728.

Norman, G., Eva, K. (2003) Doggie diagnosis, diagnostic reasoning strategies: an alternative view. *Medical Education*, **37**, 676-677.

Norman, G. (2003) RCT = results confounded and trivial: the perils of grand educational experiments. *Medical Education*, **37**, 582-584.

Norman, G. (2004) Editorial – Beyond PBL. *Advances in Health Sciences education*, **9**, 257-260.

Norris, N. (1997) Error, bias and validity in qualitative research. *Educational Action Research*, **5**,172 – 176.

O'Brien, M., Brown, J., Ryland, R., Shaw N., Chapman, T., Graham, D. (2007). Exploring the views of F2 doctors and their Educational Supervisors during a Deanery-wide Pilot Foundation Programme. *Postgraduate Medical Journal*, **82,** 813-816.

O'Neill, P. (1998) Problem-based Learning alongside Clinical Experience: Reform of the Manchester Curriculum. *Education for Health*, **11**, 37-48.

O'Neill, P., Baxter, C. (2000) Evaluation of a new problem-based learning course in a clinical environment. *Medical Education,* **33**, 222-230.

O'Neill P, Willis, S., Jones, A. (2003) Does a new undergraduate curriculum based on *Tomorrow's Doctors* prepare house officers better for their first post? A qualitative study of the views of pre-registration house officers using critical incidents. *Medical Education*, **37**,1100-8.

Oppenheim, A. (2003) *Questionnaire design, interviewing and attitude measurement.* London: Continuum.

Oxford UK Medical Careers Research Group (2001). *How future career plans have been influenced by experience at medical school. A summary of the data collected by the UK Medical Careers Research Group, University of Oxford, on behalf of Liverpool and Manchester medical schools.* Oxford: University of Oxford.

Parry, J., Greenfield, S. (1999) Community based teaching: Killing the goose that laid the golden egg? *Medical Education* **35**: 722-3.

Patel, V., Groen, G., Norman, G. (1991). Effects of Conventional Problem-based medical curricula on problem solving. *Academic Medicine*, **67**, 407-474.

Peters, A., Greenberger-Rosovsky R., Crowder, C.,Block, S. ,Moore, G. (2000) Long-term outcomes of the New Pathway Program at Harvard Medical School: a randomized controlled trial. *Academic Medicine*, **75**, 470-9.

Pittilo, R., Ross, F. (1998) Policies for interprofessional education: current trends in the UK. *Education for Health*, **11** 285-295.

Pitts, J. (2007) *Portfolios, personal development and reflective practice*, Edinburgh: ASME publications.

Poole, D. (2000) An Email Activity: Pre service Teachers' Perception of Authenticity *Journal of Technology and Teacher Education*, **8**, 13-28

Porritt, A (1962) *A Review of the Medical Services in Great Britain: Report of the Medical Services Review Committee' (the Porritt Report).*London: Social Assay

Posovac, E., Carey, R. (1991) *Program evaluation: Methods and case studies.* Englewood Cliffs, NJ: Prentice-Hall.

Poynter, F. (1966) *The Evolution of Medical Education in Britain.* London: Pitman Medical Publishing Co. limited.

Prince, K., van Mameren, H, Hylkema, N., Drukker, J., Scherpbier, A., van der Vleuten, C.(2003) Does problem based learning lead to deficiencies in basic science knowledge? An empirical case study on anatomy. *Medical Education*, **37** ,15-21.

Prince K., van Mameren H., Scherpbier, A., Hylkema, N, Drukker, J., van der Vleuten, C. (2005 a) Do students have sufficient knowledge of clinical anatomy? *Medical Education*, **39**, 326-332.

Prince, K., Van Ejis, O., Boshuizen. H., Van der Vleuten, C., Scherpbier, A. (2005 b) General Competencies of problem-based learning and non-PBL graduates. *Medical Education*, **39**, 384 – 389.

Probert, S., Cahill, D., McCann, G., Ben, Y. (2003) Traditional finals and OSCEs in predicting consultant and self-reported clinical skills of PRHOs: a pilot study. *Medical Education*, **37**, 597–602.

Radcliffe, C., Lester, H. (2003) Perceived stress during undergraduate medical training: a qualitative study. *Medical Education*, **37**, 32-38.

Reed, J., Payton, V. (1997) Focus groups: issues of analysis and interpretation. *Journal of Advanced Nursing*, **26**, 765-771.

Rees, S., Sheard, C. (2004) Undergraduate medical students' views about a reflective portfolio assessment of their communication skills learning. *Medical Education*, **38**, 125–128.

Remen, R., Derse, A., Scherpbier, A., Denekens, A., Hermman, I., Van Royen, P., Bosseart, (1999). Can medical schools rely on clerkships to train students in basic clinical skills? *Medical Education*, **33**, 600-605.

Richardson, I. (1980a) Examination performance and future careers of Aberdeen medical graduates. *Medical Education*, **14**, 356-359.

Richardson, I. (1980b) Job satisfaction in Aberdeen medical graduates 1969-73. *Medical Education*, **14**, 41 – 42.

Richardson, I. (1983) Consumer views on the medical curriculum: a retrospective study of Aberdeen graduates. *Medical Education*, **17**, 8-10.

Ritchie, J., Spencer, L. (1994) *Qualitative data analysis for applied policy research.* In: Bryman, A., Burgess, R. (eds). Analysing Qualitative data. London: Routledge.

Rolfe, I., Andren, J., Pearson, S., Hensley, M., Gordon, J. (1995) Clinical competence of interns. *Medical Education*, **29**, 225-230.

Ross, J. (1972) *Medical Education. Historical Aspects. Two papers.* Liverpool: University of Liverpool.

Ross, M. (1989) Relation of theories to the construction of personal histories. *Psychology Review*, **98**, 341-57.

Rosenthal, F., Ogden, F. (1998) Changes in medical education: the beliefs of medical students. *Medical Education*, **32**,127-32.

Rossman, G., Wilson, B. (1991) Numbers and words: Combining quantitative and qualitative methods in a single large scale evaluation study. *Education Review*, **9**, 627-643.

Roter, D., Hall, J., Kern, D., Barker, R., Cole K., Roca, R. (1995) Improving physicians' interviewing skills and reducing patients' emotional stress. *Archives of Internal Medicine,* **155**, 1877-84.

Rudland, J., Rennie, S. (2003) The determination of the relevance of basic sciences learning objectives to clinical practice using a questionnaire survey. *Medical Education*, **37**, 962-5.

Ryland, I., Brown, J., O'Brien, M., Graham, D. Gillies, R., Chapman, T. (2006) The portfolio: how was it for you? Views of F2 doctors from the Mersey Deanery Foundation Pilot. *Clinical Medicine*, **4**, 378 – 380.

Santos-Gomez, L., Kalishman, S., Rezler, A., Skipper, B. Mennin, S. (1990), Residency performance of graduates from a problem-based and conventional curriculum. *Medical Education*, **24**, 366-375.

Saunders, N., McIntosh, J., McPherson, J., Engle, C. (1990) Comparison between University of Newcastle and University of Sydney final year students: knowledge and competence. In *Innovation in medical education: an evaluation of its present status,*. Nooman, Z., Schmidt, H., Ezzat, E (eds.) New York: Springer Publishing.

Scarmalia, M., Bereitter, C. (1994) Computer Support for Knowledge Building. *Journal of the Learning Sciences*, **3**, 265-283.

Schmidt H., Vermeulen, L., Van der Meulen., H. (2006). Long term effects of problem-based learning: a comparison of competencies acquired by graduates of a problem-based and a conventional medical school. *Medical Education*, **40**, 563-7.

Schofield, J., Anderson, K. (1984). *Combining quantitative and qualitative methods in research on ethnic identity and inter group relations.* Paper presented at the Society for Research on Child Development and Study Group on Ethnic Socialization, Los Angeles.

Scriven, M (1967) The Methodology of evaluation. In R.E. Stake (Ed.) *Curriculum Evaluation* (American Educational Research Association Monograph Series on Evaluation, **1**, 39 – 83). Chicago: Rand McNally.

Scriven, M. (1980) *The logic of evaluation.* California: Edepess.

Scriven, M. (1991a) Beyond formative and summative evaluation. In M.W. McLaughlin & D.C. Philips (Ed.) *Evaluation and education: At quarter century.* Ninetieth Yearbook of the National Society for the Study of Education. Chicago: National Society for the Study of Education.

Scriven, M (1991b) *Evaluation thesaurus.* Newbury Park, CA: Sage.

Sechrest, L., Babcock, J., Smith, S. (1993). An invitation to methodological pluralism. *Evaluation Practice,* 14, 227-235.

Shadish, W. (1993) Critical multiplism: A research strategy and it attendant tactics. In L. Sechrest (Ed.) *Program Evaluation: A pluralistic enterprise.* New directions for Program Evaluation, no 60, 13-57. San Fransisco: Jossey-Bass.

Shaw, I. (1999) *Qualitative evaluation. Introducing qualitative methods.* London: Sage.

Shepherd, J. (1979) *A History of the Liverpool Medical Institution.* Chester: Bemrose Press.

Smith, H. (2002) A Course Director's perspectives on Problem-based learning curricula in Biochemistry. *Academic medicine*, **77**, 1189-1198.

Smith, G., Polett, N. (2002) Knowledge aspects of acute care in trainee doctors. *Postgraduate Medical Journal*, **78**, 335-338.

Smits, P., Verbeek, J., de Buisonje, C. (2002) Problem-based learning in continuing medical education: a review of controlled evaluation studies. *BMJ*, **324**, 153-156.

Snadden, D., Thomas, M. (1998) Portfolio learning in general practice vocational training- does it work? *Medical Education*, **32**, 401-406,

Stacey, M. (1992) *Regulating British Medicine. The General Medical Council.* Chichester : John Wiley & Sons

Stark, P. (2002) Tomorrow's Doctors: much quoted; but has it been fully implemented? *Medical Education*, **36** ,212.

Stark P (2003) Teaching and learning in the clinical setting: a qualitative study of perceptions of students and teachers. *Medical Education*, **37**, 975-982.

Strauss, A., Corbin, J. (1998) *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* 2nd edn. London: Sage Publications.

Studdert, D., Mello, M., Sage, W., DesRoches C., Peugh, J. Zapert, K., Brennan, T. (2005) Defensive Medicine Among High-Risk Specialist Physicians in a Volatile Malpractice Environment. *Journal of the American Medical Association,* **293**, 2609-2617.

Sweeney, G. (1999) The challenge for basic science education in problem-based curricula. *Clinical Investigations into Medicine*, **22**, 15-22.

Talmage, H. (1982). Evaluation of programs. In H.E. Mitzel (Ed.) *Encyclopaedia of research* (5th ed., 592 – 611). New York: Free Press.

Te Winkel, W., Rikers, R., Loyens, S., Schmidt, H. (2006) *Advances in Health Sciences Education* **11**, 381-389.

Tesch, R. (1990) *Qualitative research: Analysis types and software tools.* New York: Falmer.

Thistlewaite. J., Van Der Vleuten, C. (2004) Informed shared decision making: views and competencies of pre-registration house officers in general practice. *Education for Primary Care* , **15** , 83-92.

Thomas, R. (1997) Problem-based learning: measurable outcomes. *Medical Education*, **31**, 320-329.

Thompson, W., Lipkin, M., Gilbert, D., Guzzo, R., Roberson, L. (1990) Assessment of the American Board of Internal Medicine resident evaluation form. *Journal of General Internal Medicine*, **5**, 214–7.

Tittle, C. (1984) *Professional Standards and equity: The role of evaluators and researchers.* Paper presented at the annual meeting of the American Educational and Research Association, New Orleans.

Tiwari, A., Patrick A., Mike, S., Kwan, Y. (2006) A comparison of the effects of problem-based learning and lecturing on the development of students' critical thinking. **40**, 547-54.

Todd Report (1968). *Report of the Royal Commission on Medical Education,* Cmnd. 3569. London: HMSO.

Tolnai, S. (1991) Continuing Medical Education and Career Choice among graduates of Problem-based and Traditional curricula. *Medical Education*, **25**, 40-49.

Tucker, K., Wakefield, A., Boggis, C., Lawson, M., Roberts, T., Gooch, J. (2003) Learning together: clinical skills teaching for medical and nursing students. *Medical Education*, **37**, 630-637.

University of Liverpool. (1993) *Competency and Excellence: a career of learning. The "new" medical curriculum in Liverpool, a discussion document, Curriculum management group, October 1993.* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

University of Liverpool (1994) *The New Curriculum 1996, Overview for Boards of Faculty May 1994.* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

University of Liverpool (1995a) *The New Undergraduate Medical Curriculum 1996.* University Medical Education Unit. Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

University of Liverpool (1995b) *Proposed New Undergraduate Curriculum. Frequently asked questions (FAQS).* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

University of Liverpool (1996) *Faculty of Medicine Handbook.* Liverpool: University of Liverpool.

University of Liverpool (1999) *Evaluation in the New Undergraduate Medical Curriculum.* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

University of Liverpool (2001). *COME ALIVE, (A booklet for GP supervisors) Community Studies Unit, Department of Primary Care. Supervisor Handbook.* Liverpool, University of Liverpool.

University of Liverpool (2007) *The School of Medical Education MBChB handbook.* http://www.liv.ac.uk/sme/school/Generichandbook200708.pdf accessed 15/10/2007.

Vallis, J., Hesketh, A., Macpherson, S. (2004) Pre-registration house officer training: a role for nurses in the new Foundation Programme? *Medical Education* 2004; **38:** 708-716.

Van der Vleuten, C., Verwijnen, W. (1990) A system for student assessment in van der Vleuton C., Verwijnen, W. (eds.) *Problem-based learning; Perspectives from the Maastricht experience.* Amsterdam: Thesis Publishers.

Van Dalen J., Kerkhofs E., Van Knippenberg-Van Den Berg B., Van Den Hout, H., Scherpbier, A., Van Der Vleuten, C (2002) Longitudinal and Concentrated Communication Skills Programmes: Two Dutch Medical Schools Compared. *Advances in Health Sciences Education*, **7**, 29-40.

Verma, S., Flynn, L., Seguin, R. (2005) Faculty's and Residents' Perceptions of Teaching and Evaluating the Role of Health Advocate: A Study at One Canadian University. *Academic Medicine*, **80**, 103-108.

Vernon, D., Blake, R. (1993) Does Problem-based learning work? A meta analysis of evaluative research. *Academic medicine*, **68**, 550-63.

Wagner. P., Lentz, L., Heslop, S., (2002) Teaching communication skills: a skills-based approach. *Academic* Medicine, **77**, 1164.

Walker, M. (1965) *Medical Education in Britain.* London: The Nuffield Provincial Hospitals Trust.

Walton, H. (1994) Continuing medical education in Europe: a survey. *Medical Education*, **28**, 333-42.

Ward, B., Moody, G., Mayberry, J. (1997) The views of medical students and junior doctors on pre-graduate training. *Postgraduate Medical Journal,* **73** , 723 – 725.

Ward, B, Gruppen, L. Regehr, G. (2002) Research in self assessment: Current State of the Art. *Advances in Health Sciences Education,* **7**: 63-80.

Watmough S., Garden, A., Graham, D. (2002) *Medical Curriculum Evaluation Project, First Report.* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

Watmough, S., Garden, A., Graham, D (2003) *Medical Curriculum Evaluation Project, Second Report.* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

Watmough, S., Howard, J., Taylor, D. (2005 a) Perceptions of PRHOs and their supervisors to the introduction of undergraduate problem-based learning and community-based education in the Mersey region. (In Teaching round up) *Education for Primary Care*, **16**, 324-326.

Watmough, S., Garden, A., Taylor, D. (2005 b) *Medical Curriculum Evaluation Project. Final Report.* Liverpool: University of Liverpool. Faculty of Medicine. Unpublished internal report.

Watmough, S., Ryland, I., Garden, A., Taylor, D. (2006 c). Educational Supervisors views on the competencies of pre registration house officers. *British Journal of Hospital Medicine,* **67**, 638-64.

Watmough, S., Ryland, I., Taylor, D., Garden, A. (2006 b) Pre-registration house officer skills and competency assessment through questionnaires. *British Journal of Hospital Medicine*, **67**, 487 – 490.

Watmough, S., Garden, A., Taylor, D. (2006 c) Does a new integrated PBL curriculum with specific communication skills classes produce Pre-Registration House Officers (PRHOs) with improved communication skills? *Medical Teacher*, **28**, 264-269.

Watmough., S., Taylor, D., Garden, A. (2006 d) Pre-registration house officers (PRHOs) give their views about studying under a reformed medical curriculum in the UK. *Medical Education*, **40**, 893 – 899.

Watmough, S., Taylor, D., Garden, A. (2006 e) Educational Supervisors evaluate the preparedness of graduates from a reformed UK curriculum to work as Pre-registration House Officers (PRHOs): A qualitative study. *Medical Education*, **40**, 995 – 1001.

Watmough, S., Ryland, I., Taylor D. (2006f) Doctors assess the influence of medical school on their career choice. Proceedings of the AMEE annual conference, Genoa 2006.

Watmough, S., Taylor D. (2007a). Medical graduates assess the quality of their undergraduate medical education 6 years after graduation: a qualitative study. Proceedings of the ASME annual conference, Keele, July 2007.

Watmough, S., Ryland I., Taylor, D. (2007 b) Using questionnaires to determine whether medical graduates career choice is determined by undergraduate or postgraduate experiences. *Medical Teacher*, **29**, 830-832.

Weiss, C. (1972) *Evaluation Research: Methods for asserting program effectiveness.* Englewood Cliffs, NJ: Prentice Hall.

Whitehouse, C., Roland, M., Campion, P. (1997) *Teaching medicine in the community; a guide for undergraduate education.* Oxford: Oxford University Press.

Wilkes, M., Bligh, J. (1999) Evaluating educational interventions. *British Medical Journal*, **316** , 1269-1272.

Williams, R., Reid, S., Myeni, C., Solarsh, G. (1999) Practical skills and valued community outcomes; the next steps in community-based education. *Medical Education*, **33**, 730-737.

Williams, C., Cantillon, P., Cochrane, M. (2001) Pre-registration house officers in general practice: the views of GP trainers. *Family Practice*, **18** , 619-621.

Willis, S., Jones A., O'Neill, P. (2003A) Can undergraduate education have an effect on the ways in which pre-registration house officers conceptualise communication?" *Medical Education*, **37**, 603-608.

Willis, S., Jones, A., Mcardle, P., O'Neill, P. (2003B) A Qualitative Study of the Attitudes to Teamwork of Graduates from a Traditional and an Integrated Undergraduate Medical Course. *Advances in Health Sciences Education*, **8**, 39 -148.

Wilton, J. (1995) Pre -Registration house officers in general practice. *British Medical Journal*, **310**, 369-372.

Wolf, F. (1993) Problem-based learning and meta-analysis: can we see the forest through the trees? *Academic Medicine*, **68**, 542-544.

Wood, D. (2003) ABC of learning and teaching in medicine: Problem-based learning. *British Medical Journal*, **326**, 328-330.

Woodward, C., Ferrier, B., Goldsmith, C., Cohen, M. (1988) A Comparison of the practice Patterns of General Practitioners and Family Physicians Graduating from McMaster and other Ontario Medical Schools. *Research in Medical Education*, **27**, 276-81.

Woodward, C. (1990) Monitoring an innovation in Medical Education: The McMaster experience. In *Innovation in Medical Education: An Evaluation of its Present Status*, 27-39 Nooman, Z., Schmidt, H., Ezzat, E. (eds.) New York: Springer.

World Health Organisation (1988) *Learning to work together for health. Report of a WHO study on multiprofessional education for health personnel. The team approach.* Geneva: World Health Organisation.

Worley, P., Lines, D. (1999) Can specialist disciplines be learned by undergraduates in a rural general practice setting? Preliminary results of an Australian pilot study. *Medical Teacher*, **21**, 482-484.

Worthen B., Sanders, J., Fitzpatrick, J. (1997) *Program Evaluation. Alternative approaches and Practical Guidelines*. New York: Longman.

Yedidia, M., Gillespie, C., Kachur, E., Schartz, M., Ockene, J., Chepaitos, A. Snyder, C., Lazare, A., Lipkin, M. (2003). Effect of Communications Training on Medical Student Performance. *Journal of the American Medical Association*, **290**, 1157 -1165.