

An evaluation of the reform of the Liverpool Medical Curriculum

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By

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Abstract

Since the mid 1990s medical education in the UK has undergone fundamental changes, largely in response to the recommendations of the General Medical Council (GMC) in *Tomorrow's Doctors* (GMC 1993). In 1996 the University of Liverpool radically altered its undergraduate medical curriculum from a traditional lecture-based course to an integrated problem-based learning (PBL) curriculum, largely in accordance with the recommendations of the GMC. The primary aim of undergraduate medical education in the UK is to produce competent junior doctors known as pre-registration house officers (PRHOs) who meet the standards laid out by the GMC. As the reformed medical curriculum (RMC) has involved such a radical overhaul this dissertation seeks to assess the perceived competencies of Liverpool graduates and gather views on the content of the RMC.

The study population comprises PRHOs from the final cohort of the traditional curriculum and the first two cohorts from the RMC and their educational supervisors. Gathering data on the final cohort of the traditional curriculum has allowed comparisons between traditional and RMC graduates. Each PRHO has a named educational supervisor, a consultant or General Practitioner (GP), for each post they hold during the PRHO year, who is formally responsible for monitoring their progress.

Three main research tools have been utilised using quantitative and qualitative methodologies. Questionnaires based on the 31 key skills and attitudes PRHOs are

meant to learn as undergraduates as listed by the GMC in *The New Doctor* (1997), were sent to educational supervisors asking them to assess the competencies of the PRHOs they supervise. Each questionnaire has the competencies listed on a 5-point Likert scale ranging from “generally not at all competent” to “generally quite competent” with midpoint represented as “generally quite competent.” The same questionnaires were sent to the PRHOs asking them to assess their own performances.

Thirteen Focus groups took place with PRHOs from the study population with the aim of asking them how well prepared they felt they had been by the University to undertake the job of PRHO. They were held towards the end of the PRHO year to allow the PRHOs to reflect on their experiences since graduation and relate them to the medical course. Interviews were arranged with 59 consultants and GPs - around 25% of the educational supervisors in the Mersey area - during the summers of 2002 and 2003. The purpose of the interviews was to gain the supervisors’ views on the competencies of the RMC graduates and on the content of the RMC itself.

The three-pronged research methodology has allowed triangulation and validation between the different sources giving a fuller picture of the competencies of Liverpool graduates. The results demonstrate that the RMC graduates have been well prepared for the role of PRHO and are actually better prepared than graduates from the traditional curriculum and that curriculum reform has largely been welcomed.

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Glossary/abbreviations

A & E – Accident and Emergency

Anon. – anonymous

AMEE – Association for Medical Education in Europe

ASME – Association for the Study of Medical Education

BMA – British Medical Association

DGH – District General Hospital

GMC - General Medical Council

DOH – Department of Health

HARC – Human Anatomy Resource Centre

HMSO – Her Majesty's Stationary Office

LTM – Less than Midpoint (in reference to the questionnaire results, see chapter 5 for full explanation)

MTM – More than Midpoint (in reference to the questionnaire results)

OSCEs – Objective Structured Clinical Examinations

PETA – Professional Education and Training Appraisal

PBL – Problem based learning

RMC – Reformed Medical Curriculum

RITA – Record of In Training Assessment (final year portfolio)

PRHO – Pre- Registration House Officer

SAMP – Selective in Advanced Medical Practice (clinical placement for final year students in the reformed medical curriculum)

SSM – Special Study Module

TH – Teaching Hospital

TMC – Traditional Medical Curriculum

Chapter One. Introduction.

Background

This thesis is concerned with the evaluation of the Liverpool medical curriculum which was introduced in 1996. In the UK, the goal of undergraduate education is to produce competent pre-registration house officers (PRHOs) fit to work in the NHS and continue their medical education into specialist training (GMC 1993). PRHOs are medical graduates who have successfully completed undergraduate training at a University recognised by the General Medical Council (GMC). In the UK, the GMC is the regulatory body responsible for ensuring the standard of medical education. During the last ten years there has been widespread curriculum reform across the UK largely in response to *Tomorrow's Doctors*, a document published by the GMC in 1993 (GMC 1993) calling for major reform of undergraduate curricula in the UK. As a result of *Tomorrow's Doctors* the latter years of the twentieth century and first years of the 21st century have seen a new type of junior doctor begin postgraduate training. Since the data was collected for this thesis postgraduate training in the UK has been altered with the introduction of the Foundation Programme (DoH 2004) and PRHOs are now known as F1 doctors but they will be referred to PRHOs for the purpose of this thesis. Also, the Liverpool programme is under constant development and has been modified since the data was collected for this thesis (although the principles of the programme are very much the same). This thesis is concerned with the programme as it was from 1996 – 2002 and the way postgraduate training was in the years 2000 – 2003. A discussion of these all these reforms takes place in chapter 11.

In 1996 The University of Liverpool abolished its traditional medical curriculum (TMC) in favour of a reformed medical curriculum (RMC) based on the GMC recommendations. The RMC was not only a radical departure from the traditional curriculum it replaced, but employed educational methods and curriculum content that were largely untested in the UK. Also, as will be made clear in the following chapter, extensive curriculum reform was overdue in the UK. This thesis looks at the impact of the curriculum reform and the aims and focus of this thesis are twofold.

The first aim is to assess perceptions of the competencies of Liverpool graduates as Pre-Registration House Officers (PRHOs) i.e. do the educational methods in the Liverpool curriculum provide graduates with the necessary skills that the General Medical Council (GMC) expects. The GMC laid out these competencies for all UK graduates in their 1997 document *The New Doctor* (GMC1997). As this thesis is investigating the effect of national recommendations on medical education it has relevance to a national audience. The second aim of this thesis is to gather views on curriculum reform and the actual content of the curriculum and teaching methods employed in the RMC from the people who have undertaken the programme and their supervisors. This has allowed a fuller picture of the impact of curriculum reform rather than just focusing on the competencies of Liverpool graduates.

A number of the early documents relating to the development of the RMC in the early and mid 1990s state that evaluation of the effects of curriculum change are key principles of the RMC (University of Liverpool 1994, Bligh 1995, University of Liverpool 1999). It is also important to note that no work along the lines of this thesis had been carried out on graduates from the traditional curriculum at Liverpool. Even

without curriculum reform it could be argued this type of evaluation would have been worthwhile as little was known about how well prepared previous Liverpool graduates were for the role of PRHO.

The study population

Data has been collected on the perceived competencies of the final cohort of the TMC (2000 cohort) and the first two cohorts to graduate from the RMC (2001 and 2002 cohorts) to allow a comparison of outcomes between the curricula and give further insight into the competencies of graduates from the RMC. All cohorts were admitted to the course using the same criteria of “A” level grades and interviews. This thesis details the views of the PRHOs on their own competencies and content of their programme and the views of their educational supervisors on the perceived competencies of TMC and RMC graduates and curriculum reform. The study population is drawn entirely from Liverpool graduates and Educational Supervisors working in the Mersey Deanery area. A discussion of the relevance of using the Mersey Deanery and Educational Supervisors is included in pages 21 and 22 below.

Hypothesis

The RMC was specifically designed to produce PRHOs. My hypothesis is that the RMC will graduate competent PRHOs who are better prepared for the role of pre-registration house officer than graduates from the TMC.

Medical Education in the UK

Throughout the data collection period medical education in the UK generally consisted of 5 years undergraduate training followed by one year as a PRHO, two – four years as a Senior House Officer (SHO), and five – ten years as a specialist registrar (SpR) before qualifying as a hospital consultant. Training was shorter, but followed a similar pattern for those wishing to become a GP. Trainees are provisionally registered with the GMC immediately after they have graduated from University. After successfully completing the PRHO year they can then enter the medical register held by the GMC. The majority of PRHOs would have undertaken 6 months in medicine and 6 months in surgery as PRHOs (although a small number would have taken 4 months in medicine, 4 in surgery and 4 months in one from general practice, paediatrics, obstetrics and gynaecology or Accident & Emergency). Graduates wishing to become GPs would have undertaken some hospital rotations in specialties such as paediatrics, obstetrics & gynaecology or psychiatry as SHOs prior to undertaking GP training. SHOs wishing to become surgeons would have undertaken at least 4 surgical rotations before specialising at registrar level. Physicians would have followed the same route, but with medical attachments at the SHO level. With the advent of Modernising Medical Careers (DoH 2004) and the introduction of the Foundation Programme, postgraduate training has undergone reform during 2004 and 2005. However, the study population in this thesis will have undergone training posts as described above.

Deaneries

Postgraduate medical education is organised through Deaneries which are the organisations responsible for training junior doctors and at the time of data collection there were 8 Deaneries in England. The Postgraduate Dean ultimately has the responsibility for ensuring that training programmes offered in each area are equipping graduates to move onto the next stage of their career. Training takes place whilst the PRHOs are working as junior doctors through supervision and training on the wards and in Postgraduate centres. These centres are used for formal and informal meetings, lectures and seminars. Each hospital in the Deanery area has a postgraduate training centre which is funded by the Deanery. PRHOs have to attend a set number of “protected” teaching sessions which they have to undertake to complete the PRHO year. PRHO posts, unlike other junior doctor posts are the joint responsibility of Universities and Deaneries and generally PRHOs stay within the local Deanery to undertake their PRHO year. The local Deanery for The University of Liverpool is the Mersey Deanery and this is where approximately 90% of Liverpool graduates who form the study population of this thesis undertook their PRHO training. Given the amount of data collected it was important to keep the data collection local as tracking graduates outside the Deanery would have proven costly and time consuming.

Data collection

Three research methods have been employed.:

- Questionnaires were distributed to PRHOs and their consultant educational supervisors for the 2000, 2001 and 2002 graduates. Separate questionnaires were also distributed to GP educational supervisors. These questionnaires were based on the competencies expected of PRHOs by the GMC (1997). The questionnaires to the GP and hospital supervisors asked them to rate the performance of the PRHOs they supervise. The questionnaire to the PRHOs asked them to rate their own skills and competencies.
- Focus groups were held with PRHOs from the traditional curriculum and the first two cohorts of the reformed curriculum to ask PRHOs what they felt about the content of their undergraduate curriculum and how it had prepared them for the PRHO year.
- Interviews were held with 59 educational supervisors to ascertain in depth their views of the competencies of Liverpool PRHOs and curriculum reform in Liverpool.

A full discussion of why these methodologies have been chosen and the how the data was analysed is included in chapters three and four. There is an inherent bias in the data in that more data has been collected on the two cohorts to have graduated from the reformed curriculum. This will be included in the discussions pertaining to the results in the relevant chapters. However, although the interviews with hospital

educational supervisors occurred after the introduction of the RMC the supervisors were in a position to discuss the competencies of graduates from the traditional curriculum with whom they had worked for many years.

Table 1

Timeline of data collection/analysis

<u>Data collected</u>	<u>Time of data collection</u>	<u>Analysed</u>
Questionnaires to PRHOs and Supervisors final TMC cohorts	April – July 2001	July 2001 – February 2002
Focus groups with TMC graduates	May – June 2001	June 2001 – February 2002
Pilot interviews supervisors	May – August 2001	May 2001 – February 2002
Questionnaires to PRHOs and Supervisors first RMC cohort	April – July 2002	July 2002 – April 2003
Focus with first RMC graduates	April – June 2002	July 2002 – April 2003
Interviews with supervisors who had worked with one RMC cohort	May – August 2002	September 2002 – May 2003
Questionnaires to PRHOs and Supervisors second RMC cohort	April – July 2003	July 2003 – December 2005
Focus groups with second cohort RMC graduates	April – June 2003	July 2002 – December 2005
Interviews with supervisors who had worked with two RMC cohorts	May – August 2003	September 2003 – December 2005

Why use PRHOs in this study?

PRHOs are first year medical graduates in the UK. It was decided to use this group for a number of reasons. As the goal of undergraduate UK medical education is to produce competent PRHOs according to the standards set by the GMC it seemed appropriate to assess how well prepared graduates were to perform the tasks required by the GMC. During that first postgraduate year the influence of the University should still be strong on the PRHOs and it is a time in their career when this influence will be at its strongest. An argument against would be that some of the skills medical graduates require only manifest themselves later in their career. However, there are set guidelines to the expectations of a PRHO (GMC 1997) so it is entirely appropriate to attempt to measure PRHOs against these competencies. Also, as will be considered in chapter 11 a project has been established to examine the influence of the Liverpool medical curriculum beyond the PRHO year and extend the work of this thesis to specialist training.

Why use Educational Supervisors?

The views of PRHOs on their curriculum are important, but it was felt another perspective was needed to balance this. Each PRHO is appointed an educational supervisor through the relevant Deanery and it is their statutory duty to assess the competencies of PRHOs. For each of the 2 or 3 rotations PRHOs undertake they have a designated educational supervisor. It is the statutory responsibility of educational supervisors to gauge the performance of their PRHOs and whether they have the necessary competencies to move forward to SHO level. Using supervisors to assess

the competencies of junior doctors has been used elsewhere (Jones *et al* 2001, Jones *et al* 2002, Rolfe *et al* 1995, Dean *et al* 2003). For some skills and competencies it can be argued other junior doctors or nurses may be better placed to look at this, but in the Mersey Deanery the method of assessing the performance of the PRHOs included in this study was through portfolio assessment. Supervisors are encouraged to garner the views of the other health care professionals and junior doctors if they are unsure about the ability of a PRHO they are supervising. The Postgraduate Dean recommends that the PRHOs can enter the medical register after considering the assessments of the educational supervisors. This area will be looked at further in the questionnaire and interview chapters. Another reason for seeking the views of educational supervisors is that the overwhelming majority of educational supervisors in the Mersey Deanery are also responsible for supervising students from Liverpool on undergraduate clinical placements. Consequently they should be in a good position to relate PRHO performance to aspects of the curriculum and give opinions on the content of the reformed curriculum.

Using other junior doctors and nurses

PRHOs inevitably work closely with other junior doctors and nurses. Attempts were made to distribute questionnaires to SHO/Specialist registrars and ward managers (nurses) for the final cohort of the TM and the first cohort of the RMC to gauge their views on the competencies of Liverpool graduates. As only a small number of these questionnaires were returned for analysis and it was impossible to ascertain how many nurses and junior doctors had worked with Liverpool PRHOs these results have not been included in this thesis.

The author's position in the University of Liverpool

I have been employed by the University of Liverpool since April 2000. My first position was as a research assistant by the Department of Health Care Education working on a project called "The interprofessional training ward feasibility study". I was then employed as a research assistant on the medical curriculum evaluation project. I do not have a medical background and have a Master of Arts degree in Historical Research. Prior to these posts at The University of Liverpool I undertook research for St Helens & Knowsley Community Health Council, which at the time was NHS watchdog for the area. At the time of submission I was employed as research fellow in the School of Medical Education, Faculty of Medicine.

Ethical Approval

No formal ethical approval from an ethics committee was sought prior to data collection. If data collection had begun at the time the thesis was submitted then ethical approval would have been sought as the climate over ethics did change from about 2004 onwards. However, permission to contact the PRHOs and Supervisors was gathered from the Mersey region postgraduate Dean. He also approved the data collection methods and was informed of progress through regular meetings.

Summary of the thesis

Chapter two will look at a brief history of medical education in the UK and the rationale behind *Tomorrow's Doctors* and why a stage was reached where curriculum reform was necessary. It will also examine the content of the RMC in Liverpool compared with the TMC. Chapter three looks at the literature behind programme evaluation as applied in general terms and specifically to medical education and the literature surrounding the use of quantitative and qualitative research methods. Chapter four looks at the methods for the thesis and how the questionnaires were distributed, the focus groups and interviews were arranged and how the data was analysed. Chapter five summarises the results from the consultant supervisor questionnaires, chapter six looks at the PRHO questionnaire results with chapter 7 giving a discussion of both questionnaires. Chapter eight deals with the PRHO focus groups, with chapter nine analysing the consultant questionnaires. Chapter ten analyses the GP questionnaires and interviews. Chapter eleven concludes the thesis and looks at the implication of the results for future study.

Chapter Two. The Liverpool Curriculum and *Tomorrow's Doctors*.

Medical Education in Liverpool and the rationale for curriculum reform

This chapter will give a brief history of medical education in Liverpool and describe the traditional and reformed curricula in Liverpool. It will examine in detail why a stage was reached where curriculum reform was required in the UK and in Liverpool. It will also examine the content of *Tomorrow's Doctors* and how these recommendations have been incorporated into the Liverpool curriculum.

Medical Education in Liverpool

Medical Education in Liverpool can trace its roots back to the end of the eighteenth century and the formation of the Medical Library, which was the earliest academic organisation to be founded in Liverpool. In the eighteenth century, medical books were expensive so three surgeons in 1776 at the Liverpool Infirmary decided to purchase books and make them available to other medics and trainees in the Liverpool area (Gray 2003). Three years later, following on from the establishment of this library, the Liverpool Medical Society was formed (Shepherd 1979). The building of dispensaries was essential to the development of medical education in Great Britain in the eighteenth century (Gray 2003). The Liverpool Dispensary was built in 1777 and in 1811 lectures in medical education was started. In 1817 The Royal Liverpool Institution was founded giving another venue for further lectures in medical education to take place in Liverpool. During February 1818 Richard Formby, a local physician who had trained in Cambridge and Edinburgh set up practice in the centre of

Liverpool giving lectures on anatomy and physiology to students at a school he founded adjoining his practice (Gray 2003). In 1821 Formby moved his school to the Liverpool Royal Institution. This was closely followed by the formation of another medical school in the city centre in 1827.

At the time it was accepted that medical students had to undergo 5 years as an apprentice and attend lectures in *materia medica*, medical botany, anatomy and physiology before embarking on two final courses on the theory and practice of medicine. In the early part of the nineteenth century students had to travel to London to take their final medical examinations so there was a need for some kind of medical institution in Liverpool in order to prevent unnecessary travelling to London (Shepherd 1979).

In 1834 Formby and colleagues opened the Liverpool Royal Institution School of Medicine and Surgery. As a result of this the School of Anatomy in Seel Street which had opened in 1827 closed and the principal lecturer in anatomy and physiology from that School moved to the Liverpool Royal Institution. Other doctors from the dispensary arrived at the Infirmary to lecture on surgery, chemistry and medical jurisprudence. Three years later the new school was recognised by the Society of Apothecaries which boosted the reputation of the School (Gray 2003). The Society of Apothecaries at the time was the most influential body in medical education (Poynter 1966) although they did not have the statutory powers enjoyed by the GMC today. By 1833 there were huge demands for beds for patients by surgeons and physicians waiting to be trained. To cope with the extra demand for beds the Northern Hospital was built (and was the first in Europe to have its own ambulance service) and this was

recognised as a teaching hospital by the Royal College of surgeons in 1838 (Shepherd 1979). By 1839 the Liverpool School of Medicine and Surgery could grant certificates of attendance for students to graduate from The University of London, an honour not granted to every medical school in the UK (Shepherd 1979). In 1844 after initial disagreements over its final location between staff at the Northern and the Infirmary the Liverpool Infirmary Medical School was opened.

Throughout the 2nd half of the nineteenth century scientific institutes were formed throughout the major cities after a report showed the advantages of the continental system and the benefits this had on this teaching and industrial efficiency. University College was founded in Liverpool in 1881 with the School of Medicine incorporated as a Faculty of the College in 1882. In 1903 The University College received its charter becoming “The University of Liverpool” which meant it could now award its own degrees in medicine and surgery (Ross 1972).

Medical Education in the UK since 1858

The 1858 Medical Act

The most important Act of Parliament concerning medicine and medical education of the nineteenth century was the 1858 Medical Act which established a national system of regulating medical education by creating the General Medical Council. The Act gave the GMC power to hold a register of practitioners and to set the standard for entrance to the profession by controlling the standards of medical education and the GMC was made directly responsible to the Privy Council (anon. 1977).

It is interesting to note that for nearly a thousand years there has been some governmental regulation of the medical profession and the standards for medical education have always been to some extent been regulated by the government of the time. For example in 1421 Parliament petitioned Henry V to pass a law determining that medicine degree of a University was the only qualification granting the right to practice. In 1462 Edward IV gave a charter to the Company of Barbers allowing them to carry out surgery which helped improve their reputation. In 1511 Henry VIII decreed that no person should practice as physician or surgeon within the City of London unless examined and approved by the Bishop of London or a Dean of St Paul's Cathedral. Medical education has also reflected changes in society. The "apprentice system" of medical education which was popular for many centuries can trace its roots back Elizabethan times where the seven year apprentice period was introduced for all trades and professions.

In the nineteenth century, there were many different bodies regulating the medical profession and they all had different standards and interests. Before 1858 there were 19 separate licensing bodies in operation throughout the UK and none of them had a national jurisdiction. For example an Edinburgh practitioner might not be able to practice legally in London or even Glasgow. In the mid nineteenth century there were still a large number of charlatans, quacks, teeth pullers and bone setters with little formal training. There was a huge chasm between those "charlatans" and those students who learned medicine often at a great cost through the universities or corporations and inevitably felt cheated out of their educational investment (Stacy 1992).

The GMC began to exercise its powers over medical education soon after the Act was passed. In 1867 the council decided on the ten medical subjects which should be obligatory in terms of undergraduate teaching and examination; descriptive and general anatomy; physiology; chemistry, material medica, practical pharmacy, medicine, surgery, midwifery and forensic medicine. The first committee was made up of representatives of medical corporations, universities, colleges and 6 independent members nominated by the crown. The Council had the power to ask schools for information about current courses of study and the examinations. They didn't have the power to stipulate a compulsory curriculum, just to say "sufficient" or "insufficient" regarding individual courses but in 1861 the council began to issue "recommendations" - a practice it has continued up to this day.

"*Tomorrow's Doctors*"

As has been noted in chapter one many UK medical schools in the 1990s altered their medical curriculum directly in response to *Tomorrow's Doctors* written by the GMC in 1993 (GMC 1993). This largely followed on, but was not a departure from the concepts contained in their "Consultative Document" issued two years earlier (GMC 1991). *Tomorrow's Doctors* came about for a variety of reasons. There were a series of international pressures influencing medical education in the UK at the time. The World Federation for Medical Education issued the Edinburgh Declaration of 12 principles for reforming medical education in 1988 (anon. 1988). These were published under 5 principles five years later on (anon. 1994, Bligh & Parsell 1995). The World Health Organisation (WHO), also in 1988 published a report, which

emphasised that there should be greater shared learning between the health care professions (WHO 1988).

Also, many medical schools around the world, but in particular North America had radically altered their curricula with seemingly very few adverse effects (Albanese & Mitchell 1993). In fact the growth of PBL in medical schools can be traced to McMaster University in Canada in 1962 and spread to other schools further a field in the 1970s such as the University of Maastricht Medical school (The Netherlands) and The University of Newcastle (Australia), so there were already precedents from outside the UK on managing curriculum reform away from traditional curricula (Bligh & Parsell 1995). There was a belief amongst medical educators in the need to reinstate public health medicine with the resurgence of infectious diseases such as HIV; a shift in emphasis from hospital care to community care; a greater sharing of care within multiprofessional teams; an ageing, multiracial society; new sciences and techniques in medicine, increasing public expectations and the need for doctors to include patients in the treatment process (Bullimore 1998). The public view of doctors had changed and they were less willing to be sympathetic to the actions of doctors or take what they said at face value. Also, the huge expansion of scientific knowledge had led to vast amounts of the undergraduate curriculum being taken up with the teaching of basic sciences (Walker 1965, Bullimore 1998, Stacey 1992, GMC 1993).

There were also important historical factors behind curriculum reform and *Tomorrow's Doctors*. Undergraduate medical curricula in the UK hadn't undergone radical reform since their inception in the nineteenth century and there was a growing feeling that too much "irrelevant" knowledge was being taught to undergraduates.

Critics have been arguing for reform for many years about the content of medical curricula. Richard Davis wrote about the problem of excessive anatomy lectures in the 1750s. There have always been worries about the didactic nature of medical education. William Barret Marshall, a student in the 1820s felt the factual burden on students should have been reduced and that instead thinking and reasoning should be encouraged. He also suggested students should learn integrated anatomy teaching, long before it was introduced into UK medical curricula and that teaching should have been reduced to 6 hours a day. At the time students would be “crammed and tested” for 12 –14 hours a day. Alcock, writing at the same time felt nine hours would have been more appropriate. In the nineteenth century some educationalists thought that students should learn Greek and Latin alongside medicine, others thought too much emphasis on anatomy in the cadaver when a great deal could be learned on the living. In 1835 the London Gazette wrote that students should learn about public and private hygiene at the expense of pathology. As the quantity of medical empirical knowledge grew, then the problems of curricula content and the use of didactic methods became more prevalent (Poynter 1966).

In 1863 the GMC felt the overloading of the curriculum was followed by “results injurious to the students”. (Poynter 1966). The opening pages of *Tomorrow's Doctors* states that well over 100 years ago there were significant concerns that student doctors weren't being given enough time for self education and that there was far too much emphasis on gaining knowledge in medical curricula. The document quotes from Thomas Huxley in 1876 “The burden we place on the medical student is far too heavy, and it takes some doing to keep from breaking his intellectual back. A system of medical education that is actually calculated to obstruct the acquisition of sound

knowledge and to heavily favour the crammer and grinder is a disgrace.” In the 1870s The College of Physicians wrote to The University of Bristol criticising the anatomy, physiology pharmacy, toxicology and pathology knowledge of the candidates who had graduated from there. (Poynter 1966). In 1885 the President of the GMC stated that there had to limits the content of medical curricula as several of the scientific subjects had become so vast that “selection and abridgement” must be made.

Sir Arthur Thompson in the 1920s wrote that “memorising factual data in preparation for exams often led to neglect of the critical study of principles and independent thought.” Flexner, (Flexner 1925) offering a global view on medical education in the 1920s felt that medical schools around the world were teaching too many subjects. Arguably, the GMC with *Tomorrow's Doctors* in 1993 was finally attempting to achieve was a goal which was established by 1925. “A medical school cannot expect to produce fully trained doctors, it can at most hope to equip students with a limited amount of knowledge to train them in the spirit of scientific medicine and to launch them with a momentum that will make them active learners, observers, readers and thinkers for years to come” (Walker 1965).

Medical Education from 1945 to *Tomorrow's Doctors*

After the Second World War and the introduction of the NHS there were a series of Acts of Parliament and recommendations from the GMC which had further impact on undergraduate medical education and led directly to the publication of *Tomorrow's Doctors*. The introduction of a pre-registration year in 1953 was crucial to the

development of undergraduate medical education as much as postgraduate medical education. The pre-registration year was a direct result of the Goodenough report of 1944 (Goodenough 1944) which was the first time recognised the need for further, supervised training after the undergraduate degree. The report also recommended provision for an increase in student numbers to produce extra doctors for the NHS which was introduced in 1948. The fact that the report recommended a pre-registration year to ease the burden on undergraduate curricula highlighted the concerns even then about the preparedness of junior doctors for practice after graduation (Stacy 1992).

In 1957 the GMC (GMC 1957) advised a “lighter and more flexible” curriculum, asking medical schools to consider experimenting with curriculum content and teaching methods. In 1962 the Porritt Report (Porritt 1962) concluded “We cannot escape the conclusion that the medical facilities of British Universities are now lagging considerably behind those of many comparable countries in respect of research facilities, accommodation and available teachers....” Students also seemed to have a narrow experience of the range of clinical work. The lack of contact between the full-time clinical teachers and the GPs who referred patients to the hospitals only aggravated the narrowness of the educational experience in undergraduate curricula. In the 1960s, there was still very little integration between different parts of the medical curricula (Walker 1965).

The 1967 (GMC 1967) recommendations suggested doctors should have an appropriate understanding of medicine as an evolving science and art and undergraduates education should provide a basis for further vocational training.

Specialists should come from postgraduate training not undergraduate medical curricula. The GMC also stressed the importance of having diversity between medical schools. The problems of medical education were further highlighted under the Todd Report (1968) which stated “The undergraduate medical course does not provide sufficient training for the immediate practice of medicine”. In the 1970s although the medical curricula throughout the UK differed from institution to institution, curricula were still dominated by lectures with a pre-clinical and clinical course and eight Universities still ran “pre-medical courses” and there was little formal integration of subjects (anon 1977).

Before 1972 Parliament largely left the GMC to its own devices but a “revolt” of the late 1960s over compulsory payments to enter the medical register forced parliament to take a closer interest into the role and function of the GMC. As a result the Merrison enquiry was set up to look at how the GMC was operating at that time. One of the recommendations from the ensuing Merrison enquiry suggested that the GMC had to raise the standard of undergraduate and postgraduate education “to make a clinician out of the graduate” (Merrison 1975). Merrison also commented on what he saw as the failure of the educational component of the pre-registration year. The Merrison Report was a big influence on the 1978 and then 1983 Medical Acts which officially recognised that the aim was no longer to produce a graduate who was competent in medicine, surgery and obstetrics.

This was a major break with the traditional aims of medical curricula and was a central tenant of the thinking behind *Tomorrow's Doctors*. It wasn't until this point in the UK that it was formally recognised that the aim of undergraduate training was not

to produce to a graduate who was competent for independent practise in medicine, surgery and obstetrics. Up until this point the goal of UK undergraduate education still took its objectives from an 1886 Act which required “the standard of proficiency required from candidates at a qualifying examination shall be such as sufficiently to guarantee possession of the skill and knowledge required for the practice of medicine, surgery and midwifery”. Despite this change and the changes to postgraduate training and the specialties little seemed to change in the eyes of teachers and examiners. What was seen as “overload” continued to grow despite reforms to postgraduate exams which would allow the burden on undergraduate curricula to be eased (Bullimore 1998).

Crucially, the 1978 Act reformed the structure of the GMC and created a semi-independent education committee and that the GMC should be responsible for co-ordinating all stages of medical education and promoting high standards. The Education Committee was given extended powers to visit Universities and more control over the pre-registration year. In the early 1980s the Education Committee started using its rights to visit medical schools to see how its recommendations of 1980 were being implemented. There was some anxiety about interfering in “university autonomy” (Stacy 1992) and at first only qualified doctors were including in the visiting parties. This set a precedent for more thorough visits which started in the 1990s following *Tomorrow's Doctors*. Previously the GMC recommendations on medical education were meant to be as Sir Donald McAllister pointed out in 1922 “the expression of a concordat amiably reached” after much consultation (anon 1977). As the 1990s approached the GMC was taking a more active interest over medical education.

As has been illustrated above the GMC had become increasingly concerned about medical education and the time was right to publish *Tomorrow's Doctors*. It was also apparent by the 1990s that many doctors felt inadequately prepared to work as junior doctors as a result of undergraduate training (anon 1992), and that by the 1990's the GMC (1991) wanted doctors capable of independent learning, critical thought (Fraser 1991) the ability to cope with change, which was essential in the professional environment (Irvine 1993). Other criticisms focused on the lack of readiness for clinical practice (anon 1988) including the inability to carry out practical procedures or cope with critical incidents as they arose in the PRHO year or even communicate with patients and other members of the health care professions. For example Bogg *et al* (2001) found that 52% of House Officers required further advice/training on technical and management side of the job, whilst Lambert *et al* (2000) found nearly a quarter of House Officers perceived they were asked to perform tasks for which they had not received adequate preparation to carry out. In the early 1990s Calman and Donaldson (1991) came to similar conclusions. Just prior to *Tomorrow's Doctors* the GMC outlined the proposals they would formally recommend in *Tomorrow's Doctors* which included the introduction of a substantial amount of problem-based learning. There was also a realisation that the under utilisation of General Practice in undergraduate medical education was contributing to these problems (Bligh 1994, Bligh & Parsell 1995).

Since the mid 1990s the GMC education committee has visited all UK medical schools to see how far *Tomorrow's Doctors* has been implemented (GMC 1999, Christopher 2002). For the first time the GMC actually insisted that their recommendations should be adhered to. When *Tomorrow's Doctors* was issued all

medical schools had to take notice and implement the recommendations and Liverpool was not alone in changing its course. For example in the UK by 1997 Universities at Aberdeen, Manchester, Glasgow, Kings College, London and Leicester had introduced brand new curricula with many more such as Cambridge, Leeds, Newcastle and Wales introducing less dramatic changes directly in response to *Tomorrow's Doctors*.

So *Tomorrow's Doctors* was grounded in historical reasons and arguably can trace its roots to the 1860s when the GMC began making recommendations on undergraduate medical education. Before considering the content of the Liverpool curriculum it is worth taking a brief look at the content of the document.

Tomorrow's Doctors

One of the most striking recommendations in *Tomorrows Doctors* is that medical students should be prepared to work as PRHOs, not specialists, thus making the preparation for the first postgraduate year the central outcome of undergraduate medical education, reinforcing the recommendations of the 1983 Medical Act (see pages above). Throughout the document many references are made to reducing the “factual burden” and discussing the “gross overcrowding” in undergraduate curricula. Also that “the scarcely tolerable burden of information that is imposed taxes the memory and not the intellect. The emphasis is on the passive acquisition of knowledge much of it to become outdated or forgotten.” It also suggests a way round this would be to integrate the science and clinical teaching in the core curriculum so that the undergraduate curriculum is the “first step in the continuum of medical

education". With a structure of specialist training in place the document recognises there was a case for moving some factual knowledge to a later stage of medical training. The GMC called for "essential" knowledge to be covered by the "core curriculum" and suggested that each "core curriculum" should be freely available so medical schools are aware of the content of each others curricula and the Liverpool curriculum can easily be accessed (University of Liverpool 2007).

Medical students should also learn about evidence-based understanding of diagnosis and diseases whilst making the most of modern Information Technology. Assessment procedures should reflect these aims and there should be a movement away from for example multiple choice questions to a system that encourages certification of achievement in competency and reduce emphasis on the uncritical acquisition of facts. Also that the format of multiple choice tends to "put a premium on the acquisition of facts at the expense of reasoning". It also called for improvement in clinical skills teaching and assessment including better experience of undertaking practical skills and that students should be formally assessed on these skills prior to graduation in order to ensure they have the required skills to work as PRHOs. The GMC recommended the increased use of logbooks or computer based systems for recording student experience and performance in place of "traditional" exams.

The GMC also set out to encourage student choice outside the core curriculum and argued for Special Study Modules (which at the time of submission were known as Student Selected Components) to facilitate this, which should also encourage critical thinking and develop lifelong learning skills which of course can be reinforced by the introduction of PBL into the curriculum. PBL was also envisaged as a way of

reducing the “factual burden” of teaching unnecessary didactic science knowledge through the lectures which were used in traditional curricula and would reduce the capacity of individual departments to “overload” the curriculum. Flexibility in the curriculum would also allow students to explore career choice prior to graduation. Curricula should demonstrate to the student the importance of legal and ethical issues, cultural social and emotional and psychological problems and impact of illness on the patients’ family. Allied to this is a need to understand health promotion, disease prevention and knowledge of public health and tied in with these was the need to recognise the effects of an ageing methodology. The GMC also recognised that the public had changing aspirations and called for improvement in practical skills training.

On page 15 the document examines attitudinal objectives of undergraduate medical education. These included; showing respect for patients and colleagues; being aware of limitations; knowing when to ask for help and being aware of limitations and coping with uncertainty. Students should be expected to participate in the peer review and keep a record of their own skills and be aware of their own professional development needs. *Tomorrow’s Doctors* calls for doctors to be educated with an understanding of other health care professionals and primary care. Clinical teaching should reflect the changing patterns of health care so there should be greater experience of primary care alongside hospital teaching. By the 1990s over 90% of NHS consultations took place in the community (Bligh 1994). Many generic medical skills could be learned in the community and that this was an under-utilised educational resource so there should be a shift from teaching in the hospitals to General Practice. This would also help student gain more of an insight into the social

and emotional factors involved in medicine. These recommendations were clarified in the postgraduate setting in the 1997 document *The New Doctor* (GMC 1997) which clarified the skills and competencies expected of UK graduates in the PRHO year. These will be looked at later on the thesis and in particular during the questionnaire chapters (5-7).

Table 2 The key points of *Tomorrow's Doctors*

<p>Attitudes and behavior that are suitable for a doctor must be developed. Students must develop qualities that are appropriate to their future responsibilities to patients, colleagues and society in general.</p>
<p>The core curriculum must set out the essential knowledge, skills and attitudes students must have by the time they graduate</p>
<p>The core curriculum must be supported by a series of student-selected components that allow students to study, in depth, areas of particular interest to them.</p>
<p>The core curriculum must be the responsibility of clinicians, basic scientists and medical educationalists working together to integrate their contributions and achieve a common purpose.</p>
<p>Factual information must be kept to the essential minimum that students need at this stage of medical education.</p>
<p>Learning opportunities must help students explore knowledge, and evaluate and integrate (bring together) evidence critically. The curriculum must motivate students and help them develop the skills for self-directed learning.</p>
<p>The essential skills that graduates need must be gained under supervision. Medical schools must assess students' competence in these skills.</p>
<p>The curriculum must stress the importance of communication skills and the other essential skills of medical practice.</p>
<p>The health and safety of the public must be an important part of the curriculum.</p>
<p>Clinical education must reflect the changing patterns of healthcare and provide experience in a variety of clinical settings.</p>
<p>Teaching and learning systems must take account of modern educational theory and research, and make use of modern technologies where evidence shows that these are effective.</p>
<p>Schemes of assessment must take account of best practice, support the curriculum, make sure that the intended curricular outcomes are assessed and reward performance appropriately</p>
<p>When designing a curriculum, putting it into practice and continually reviewing it, medical schools must set up effective supervisory structures which use an appropriate range of expertise and knowledge</p>

Development of the Liverpool Curriculum

The Liverpool curriculum can trace its' origins back to the late 1980s where discussions within the university took place prior to the publication of *Tomorrow's Doctors*. By the mid-1980s a number of the Faculty's senior members recognised the course, as it stood in Liverpool had to change. As well as echoing the national concerns listed in the previous pages it was believed there was an overcrowding of the curriculum combined with governmental concentration on the re-distribution of ever-diminishing resources which made continuing with the traditional curriculum untenable even prior to the publication of *Tomorrow's Doctors* (The University of Liverpool 2001). By 1990 a Curriculum Strategy Group of the University of Liverpool had been formed. This group included the Dean, the professors of general practice, medicine and surgery, a senior surgeon, a physiologist, a physician, an anatomist and a physiotherapist (Bligh 1995). After a detailed debate with the faculty through the heads of department a detailed philosophy was described to underpin the curriculum using seven principles under the acronym INSPIRE which stood for: Integration, Networking, Student-centred, Problem-based, Innovative, Research, Evaluation and followed the SPICES model of curriculum development. The SPICES model also suggests that the curriculum should be student-centred, problem-based and integrated (Harden *et al* 1984, Bligh 1995, University of Liverpool 1995a, University of Liverpool 1995b, University of Liverpool 1996). By 1991 the group saw that its' own ideas were compatible with the recommendations of the Kings Fund and the GMC (GMC 1991) but that to implement these recommendations would require a radical overhaul of the curriculum.

Originally, in the academic year 1991-1992 it was envisaged a new curriculum with a PBL approach would be introduced in October 1995 (University of Liverpool 1993). The original outline differed from the curriculum which was introduced in 1996. By 1995 a model more in keeping with the curriculum as it is today had emerged (University of Liverpool 1996) although changes were made right up until delivery (Griffiths & James 2000). For example the final outline to the final year was only completed in 2000, months prior to the first cohort of the new curriculum commencing their final year. By 1995 the final day-to-day implementation of the course was the responsibility of the Curriculum Management Group. This comprised a group of 5 faculty members supported by the medical education unit (Bligh 1995) which saw that the new curriculum was ready to begin in September 1996.

The Traditional Liverpool Curriculum

The traditional curriculum was based on passive learning styles which comprised a 5 term pre-clinical course followed by a 9-term clinical course with little formal integration between the 2 parts of the curriculum. In the first five terms students undertook an intensive series of lectures and practicals on biochemistry, biology, biostatistics, genetics, anatomy, physiology, behavioural science (psychology) and pathology. Students then learned medicine, surgery and the specialties such as obstetrics and gynaecology, psychiatry, ENT, child health, dermatology, cardiology, geriatric medicine in separate blocks in years three to five. Examinations took place at the end of the two distinct parts of the curriculum. General Practice only accounted for three weeks and there were few formal communication or clinical skills classes. In 1960 a new 2 year long pre-clinical course was introduced and in 1966 further changes were

made following the Royal Commission on Medical Education. Slight alterations were made in 1986 when clinical attachments were consolidated so students did not spend time travelling each morning between the university and their clinical attachments (Gray & Sheard 2001). But in essence the old curriculum hadn't radically changed for years.

The Reformed Liverpool Medical Curriculum

The reformed Liverpool curriculum bore little in common with the traditional course and rationale behind the different components was geared towards remedying the perceived problems in medical education during the 1990s.

In order to reduce the “factual burden”, facilitate self-learning skills and critical thinking skills amongst students the Liverpool course uses problem-based learning (PBL) as the main learning activity from years 1 –4. Using PBL as opposed to didactic lectures in the traditional curriculum was a massive shift in the Liverpool curriculum.

There are many forms of PBL (Davis & Harden 1999) and defining can be difficult to achieve (Maudsley 1999). Although it is seen as a relatively new phenomenon it can be argued it has its roots as far as back as 1889 when a method known as “multiple working hypothesis” was advocated as an early form of PBL (Chamberlain 1965). The first medical PBL curriculum was implemented at McMaster medical school, Ontario (Nuefeld & Barrows 1974). With contemporary educational theories it shared an emphasis on process and skills, rather than interim outcomes (Knowles 1975) and

should help students acquire self-directed learning skills (Barrows 1986, Blake *et al* 1995), make clinical cases more stimulating and engaging for students which in turn would make learning more enjoyable (Barrows 1986). It has been well established that the importance of the learning activity (Dewey 1911, 1916) and that the learner should be active in the process. PBL is also tied in with “constructivist” pedagogy whereby learners build their knowledge in response to sensory inputs from authentic experiences (Poole 2000, Brown & King 2000) and students should be encouraged to construct their own knowledge (Scarmalia & Bereiter 1994). Students when they construct knowledge do not absorb it as it is delivered to them but instead build on their previous knowledge and experiences (Barrows & Tamlyn 1980).

One of key tenets on the PBL in the RMC is that students build on their previous knowledge and experiences. Recently, Universities began adjusting teaching methods to these ideas (Fyrenius *et al* 2005) and this is one of the processes behind the Liverpool curriculum. A fuller discussion of the literature relating to PBL and its effectiveness in medical education is included in the next chapter.

One way of clarifying the Liverpool approach to PBL is to say it is based on the “Seven Steps” approach adapted from the University of Limburg (now The University of Maastricht) seven-step model for PBL groups (The University of Liverpool 2001). These seven steps are; clarify terms, define the problem, analyse the problem on the light of the data presented, suggest hypotheses, identify learning objectives, go away and study, report back. The University of Limburg curriculum was introduced in 1975 when the medical school opened there and was based on the McMaster model (Van der Vleuten & Verwijnen 1990). Some of the staff who developed the RMC at

Liverpool visited both Maastricht and McMaster prior to 1996 and the programme at Liverpool includes elements of each although the 7 steps approach to PBL dominates.

Table 3

Pre 1996 “traditional” medical curriculum

Content	Teaching	Assessment
<hr/>		
Pre clinical course		
Years one and two (terms 1-5) Pre clinical course	Lectures Laboratory based practicals and demonstrations	knowledge exams per subject pre clinical exams part 1 and 2
Biostatistics Medical informatics Biology Biochemistry Genetics Anatomy Physiology Pathology Behavioural sciences psychology		
<hr/>		
Clinical course		
Year two - year three (terms 6-9)		
Introduction to medicine and surgery course medicine, surgery, orthopaedics, geriatric medicine laboratory based paramedic clinical teaching elective	bedside hospital teaching lectures	Finals, part one (written papers, multiple choice)
Year four Obstetrics & Gynaecology (O&G), child health (10 weeks) Elective (4 weeks) General Practice, dermatology, neuro science (3weeks) Ophthalmology, ENT (2 weeks) Haematology, radio diagnosis (1 week)		
Year five Medicine, surgery, psychiatry Tutorials anaesthetics and O & G Revision tutorials/reading time		final exams (parts two and three in medicine, surgery and O & G written papers, multiple choice, long cases)

Table 4

RMC as it was when it was first introduced in 1996.

Phase one Normal structure and function Year one	PBL Communication Skills Clinical Skills, HARC Daily Plenary Sessions Optional: Lab Practical	Φ 1	SSM 1	PBL Communication Skills Clinical Skills HARC	Daily Plenary Sessions	Σ 1	
Phase 2 The human life cycle							
Year 2	PBL Plenary Sessions Clinical Practice	SSM 2	PBL Communication Skills Plenary Sessions Clinical Practice	Φ 2	SSM 3	PBL Plenary Sessions Clinical Practice	Φ 2
Year 3	SSM 4	PBL Clinical Practice	PBL Clinical Practice	Σ 3	PBL Clinical Practice SSM 5	Elective	
Year 4	PBL Clinical Practice	Φ 4	PBL Clinical Practice	Σ 4	SSM 6		
Phase 3 - INTENSIVE CLINICAL EXPERIENCE							
Year 5	COMP (including Communication Skills) 2 x SAMP (Opportunity to undertake Erasmus Exchange x 1) A&E Ward 5 Rotations (8 week blocks)						

Φ = formative assessment

Σ = summative assessment

In Liverpool the tutorials are organised into series of modules, each of which lasts 2 weeks and are based on a clinical case. During the tutorials students generate the learning objectives which they research outside the groups. In the first year students are introduced to the science of medicine whilst they follow the human life cycle in years two – four revisiting material introduced in the first year. The students become increasingly more responsible for their learning throughout years one to four. The PBL also helps with the development of attitudes such as team working and being aware of limitations and knowing when to ask for help.

There are study aids in place to support students learning. In the first year they are timetabled in the Human Anatomy Resource Centre and are able to use the Centre throughout the rest of the curriculum for further study. Students also have plenary sessions to help and optional laboratory sessions in subjects such as biochemistry to complement the PBL sessions in the first year and assist them in reaching their learning objectives. The PBL sessions and supporting learning aids replaced a larger proportion of the lectures which were used in the traditional curriculum. In order to facilitate deeper learning and compliment the effect of PBL exams are placed throughout the course with “finals” consisting of written and Objective Structured Clinical Exams (OSCEs) taking place in the 4th year. The final year is assessed through the portfolio and a series of interviews instead called RITA (Record of In Training Assessment) which has now been renamed PETA (Professional Education and Training Appraisal).

Four themes structure the new course: Structure and function in health disease; individuals, groups and society; population perspective; professional and personal

development. There was originally no patient contact for the study population in the first year but this increases from years 2 –5. Students deal with legal and ethical issues in the PBL scenarios and to give a greater perspective of their role as doctors they undertake a module looking at the history of medicine to gain a perspective on their own learning and future practice.

The old pre-clinical/clinical divide has been abolished to integrate science teaching and allow early clinical skills tuition with students introduced to practical and clinical skills training in a Clinical Skills Resource Centre from the first semester. This includes training in history taking and examination skills as well as training on basic practical procedures which students learn on simulated models at first. Students are timetabled for communication skills training in the first and second years and are assessed on communications skills throughout their undergraduate course by OSCE stations and the portfolio. Students undergo further communication skills tuition in general practice and a 4th year placement in palliative care.

In order to increase student options for self study, to ease content overload and to replace the traditional style curriculum with a core and options curriculum, student choice Special Study Modules (SSMs) and Special Medical Practice (SAMPs) have been introduced. These allow students to study in depth a range of topics and in the RMC students select approximately a 25% of their undergraduate placements.

Community placements now account for approximately 30% of the clinical placements in the curriculum, culminating in a 7 placement at a GP surgery in the final year. Students are encouraged to understand the social and emotional factors in illness in the community. Throughout the course the students are expected to work

with other health care professionals in the community and in the hospital. Another of the goals of PBL, by the very nature of working through the scenarios, is to foster team working amongst medical students. Year five is an intensive clinical year designed to prepare the students specifically for PRHO study. As well as the primary care attachment this year includes an opportunity for students to “shadow” their first PRHO post, a placement in Accident & Emergency and two clinical attachments (SAMPs) of their choice.

Since the curriculum was introduced some changes have been made to the PBL format. More plenary sessions have been introduced – students now have one plenary session a day in the first year. A website has been designed where the students can post their learning objectives at the end of each PBL 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 being re-written regularly to improve the triggers that allow the students to identify learning objectives. These changes will be discussed in the conclusion to this thesis and were only introduced after the study population had passed through the course. For a fuller view of the course details are included on the University of Liverpool website (The University of Liverpool 2007) and in table 4 above.

Chapter 3. Literature Review.

This chapter will examine the literature and general principles surrounding curriculum and programme evaluation and how this pertains to medical curriculum evaluation. It will also look at the literature concerning the merits of using different research methodologies in curriculum evaluation. It will also discuss examples from the literature about how medical schools have evaluated their medical curricula and the literature surrounding evaluation of PBL in a curriculum.

Literature curriculum/programme evaluation in general

One of the most prominent and influential writers about curriculum evaluation has been Kirkpatrick (1975) who suggests that curriculum evaluation can be divided into 4 stages. Stage one looks at administrative, contextual and organisational factors relating to the teaching which includes evaluating satisfaction of the course. Stage two examines the effects the curriculum has on student learning and looks to ascertain how the curriculum imparts knowledge and skills. The third stage measures change in behaviour in the learner as a result of the course with the final stage looking at the wider impact of the course which includes for example, looking at the competencies of graduates from the programme under evaluation in the workplace.

This thesis uses all 4 stages of Kirkpatrick's model. For stage one the graduates from the Liverpool curriculum are asked their views on the content of the course during focus groups and educational supervisors who also teach undergraduate students are asked their views on the curriculum during the interviews. For stage two, the

questionnaires in particular provide a quantitative measure of the perceived skills of the PRHO. This thesis looks at comparisons between traditional and reformed curricula graduates and if the RMC is producing a different kind of PRHO – which covers stage three of Kirkpatrick’s model. Stage 4 encompasses the overall aim of this thesis which is to examine whether the curriculum is producing graduates with the necessary ability to work as PRHOs in the NHS.

Other literature on curriculum evaluation often has elements of Kirkpatrick’s model included in it. Scriven (1967) and Talmage (1982) believe that programme evaluation has one overriding goal, which is to determine the worth of whatever is being evaluated and the role of the programme. Any evaluation, whether an evaluation of a marketing plan, a school curriculum, a training programme or the level of re-offending from a prison is undertaken to identify and supply defensible criteria to determine its worth, merit or quality (Scriven 1967). Scriven has elaborated on these views in more recent years without abandoning them (Scriven 1980, 1991a, 1991b). Evaluation can also have an empowering aspect which can determine how budgets are allocated, assist institutions to satisfy external funders and secure more funding. If a summative evaluation is made public it can enable programme decision makers and potential customers to make judgments about that programme’s worth. Weies (1972) points out that many grants have the condition of an evaluation requirement.

Worthen *et al* (1997), using similar ideas to Scriven (1980, 1991a, 1991b) highlight the fact that there are many changes in the modern world which bring real or potential problems so evaluating these changes for their impact is a constant necessity.

Worthen *et al* (1997) also point out along the same lines as Weies (1972) that when

new educational programmes are introduced then the outcomes need to be measured. They say that certain questions need to be answered. What is the cost, does it work well, why doesn't it work well, would it work better in a different environment, are some parts of the programme working, but others parts not working and why should this be?

Worthen *et al* (1997), like Kirkpatrick (1975) also identify certain stages of evaluation. In the first instance questions should be devised which provide the direction and foundation for the evaluation and these should be directed towards whatever standard is expected of what is being evaluated. There is often a divergent phase where a comprehensive "laundry list" of potentially important questions with many sources, hardly any excluded, and all directions considered. (Worthen *et al* 1997). After this comes the convergent phase where the evaluator selects from the laundry list the most critical questions to be addressed. New questions may emerge so the researcher must remain flexible. Tittle (1984) agrees with Worthen *et al* (1997) about the need for flexibility because standards set by autonomous professional groups are more likely to be more convergent than divergent. The evaluation questions should remain flexible in case new standards or issues emerge.

More often the evaluative question is a descriptive one – to show a trend, illustrate a process, to convey the status of something, or describe and analyse a program, process procedure (Guba & Lincoln 1981). Cross-sectional methods can be used to assess public opinions and case studies to describe critical components. Guba and Lincoln (1981) have also used the term "thick description" to refer to certain types of descriptive studies – informing stakeholders what is actually happening in a program.

Others may make use of descriptive case studies to examine changes that occur in target groups affected by the curriculum (Datta 1995).

The core of educational evaluation is helping educators improve education.

Educational evaluation can have both a formative role identifying where teaching can be improved or a summative role whereby the effectiveness of the teaching is judged.

Although educational evaluation uses tools that are similar to those used in educational research the results are more general and more value is invested in interpretation of results of evaluation. The evaluator should involve the client and other stakeholders in deciding what information would best answer each evaluation question and the evaluator lays an active and pivotal role (Cronbach 1982). This ties in with the aims suggested by Worthen *et al* (1997), Scriven (1967) and Kirkpatrick (1975) and those put forward by Edwards (1991) who emphasises the importance of including the views of teachers and students as stakeholders. In examining the impact of policies that affect whole groups (e.g. changes in laws or regulations) evaluators may use multiple regression or other statistical methods to help in answering the evaluation question (Folz & Hazlett 1991, Freeman *et al* 1980).

Pages 53 and 54 above show how this thesis ties in with the aims of Kirkpatrick. It also fits closely with views put forward by the other writes on curriculum evaluation. The work in this thesis sits comfortably with the work of Guba & Lincoln (1981) in the way it is looking to describe the curriculum and the processes going on within the curriculum. This is particularly relevant to the qualitative data collection where it is discussed which parts of the RMC are particularly useful in preparing graduates to work as PRHOs. As few outcomes studies can be completed without a description of

the programmes being evaluated, the use of qualitative data helps enrich the views of the participants of the programme that is undergoing the evaluation (Worthen *et al* 1997). The overall aims of the evaluation in this thesis tie in with the views of Scriven (1967), Talmage (1972), Datta (1995) and Worthen *et al* (1997) by determining the worth of the course and the impact of it on the competencies of graduates. This thesis does look at whether the RMC is providing a return on the investment and effort to introduce a brand new curriculum. This work is also relevant to stakeholders (Cronbach 1982, Worthen *et al* 1997) with an interest in the Liverpool curriculum - and the former students and supervisors who comprise the study population are part of the evaluation and most evaluations are strengthened by including stakeholders in the study population (Edwards 1991 Weies 1972 Worthen *et al* 1997). The results are of relevance to the curriculum managers and on a wider issue the results would be of interest to the future students, the NHS, patients and the GMC. Outside of the University the GMC conduct their own evaluation of UK medical schools (e.g. GMC 1999, GMC 2005) through visits to ensure standards are met but they do not directly relate the parts of a curriculum to competencies as a junior doctor. By combining the approaches outlined by Kirkpatrick (1975), Worthen *et al* (1997) and Scriven (1967) it can be seen which components of the RMC are seen as successful and which, if any components of the curriculum can be improved. Views on the major components of the curriculum (PBL, communication skills, assessment, the Clinical Skills Resource Centre, community placements for example) all come out in the data alongside the competencies of Liverpool graduates.

The GMC is also important in determining the research questions. Worthen *et al* (1997) and Tittle (1984) state the importance of setting the questions. Once the

evaluation questions were known it was then decided who to ask and how to ask them. It seemed the most important views to gain were of PRHOs and Supervisors for the reasons already outlined in chapter one – i.e. how well prepared are graduates to work as PRHOs and what do graduates and supervisors think about the content of the RMC. As will be discussed later in the next chapter and chapters 8 and 9 in particular within these two “general questions” the “smaller” or “complimentary” questions needed to answer these two main questions have remained flexible and open to slight alteration where necessary as the data collection has progressed.

Using qualitative and quantitative data for curriculum evaluation

This thesis uses multiple research methods. Posavac and Carey (1991) have written that it is often better to use multiple research methods and many programme evaluations use multiple designs (Worthen *et al* 1997). Cook (1985) and Shadish (1983) have argued that it is possible to use “critical multiplism” to unify quantitative and qualitative methods as a form of triangulation and that this triangulation should not only be applied to the measurement phase but other phases in the data collection and analysis stage. This in effect, is what has happened in this thesis and will be examined further in chapter 4. More than one research methodology is required for thoroughness and there are very few outcomes that can be studied comprehensively using only quantitative methods (Worthen *et al* 1997). All research methods are subject to some inherent bias but if different methods are employed then the bias can be reduced. As there is also an issue of when evaluation becomes research it is therefore important that rigorous standards of reliability must be applied regardless of whether qualitative or quantitative data is used (Green *et al* 1998). These issues of

rigour have been covered in this thesis. For example mixed methodologies have been used and the questionnaires used in this thesis were based on questionnaires validated by the University of Manchester (Jones *et al* 2001, Jones *et al* 2002). Data was collected on the second cohort of the RMC to negate any bias from a possible “first cohort effect” from the 2001 graduates.

Quantitative vs qualitative methodologies

There have been serious debates about the strengths of quantitative versus qualitative research in any project or evaluation and the debate has been at times quite vitriolic as well as unnecessary (Worthen *et al* 1997). In the 1960s most programme evaluators ignored qualitative methods deriding them as unnecessarily “soft”. However, by the 1980s after work by people such as Howe (1988), Kidder & Fine (1987), Cook & Reichardt (1979), this had given way to moves to integrate both types of research methodology. Although there was a re-enactment of the debate in the late 1980s/early 1990s between proponents of qualitative methods (for example Lincoln & Guba 1994) and quantitative (e.g. Sechrest *et al* 1993) many scholars felt that qualitative and quantitative were compatible and could compliment each other strengthening the overall conclusions (Schofield & Anderson 1984; Mark & Shotland 1987; Chelimsky 1995).

Schofield & Anderson (1984) believe that qualitative enquiry is often conducted in “natural” settings such as schools, has the researcher as the “chief instrument” in data gathering and analysis, emphasises “thick description (obtaining “real”, “rich”, “deep” data which illuminate everyday patterns of actions and meaning. The strengths of

qualitative data lie in its “richness and holism” and can reveal vivid “thick descriptions” which are more than just snapshots and give reasons why people think or feel the way they do. Qualitative research is concerned with understanding the respondents’ rather than the researcher’s perspective and is complimentary to the quantitative research (Bligh 1994). Also, using open ended questions forces the individuals to think more clearly than they would by just filling in questionnaires. It also allows the researcher to react flexibly to emerging themes and issues and explore processes as opposed to just looking at outcomes. Quantitative focuses on the testing of specific hypotheses and emphasises standardization, precision, objectivity and reliability of measurement as well as replicability and generalizability of findings and therefore focused on producing numbers and numbers which are suitable for statistical tests. Some commentators feel there is less bias in quantitative methods compared with qualitative (Sechrest *et al* 1993) which is not a view shared by the author of this thesis. A full discussion of the merits of using the quantitative and qualitative methodologies as applied to this thesis is included in chapter 4.

Qualitative research is particularly useful when it is used to supplement, validate, explain or reinterpret quantitative data. This will be a recurring theme in the discussion sections to the chapters in this thesis. As well as giving a “more complete picture”, qualitative and quantitative methods can be used in sequence to inform the next stage of data collection. How these points relate to this thesis will be looked in more detail in chapter 4 and in chapters 8 and 9. Choosing a methodology to investigate an educational research question, though is no different to any other type of research (Hutchinson 1999).

As Worthen *et al* (1997) put it when answering the question whether to use quantitative or qualitative: “To most evaluators today the obvious answer is both. Insightful integration of both qualitative and quantitative methods within a evaluation design is now so widely accepted there seems little point to the debate... in short the majority of contemporary evaluators clearly view quantitative and qualitative methods as compatible, complementary approaches in evaluation of educational programmes... few paradigm purists are left to carry on a debate that has largely lost its audience.”

Medical Curriculum Evaluation

It has been reported that literature searches on medical curriculum evaluation can provide disappointing results (Colliver 2000). Historically, members of the medical profession have been reluctant to value research into the effectiveness of educational interventions (Buckley 1998) and Green *et al* (1998) suggests that faculty evaluation is a controversial subject at most universities. Faculties can be fearful that evaluators will be not be objective, students won't give accurate evaluations and the results may require further development of the programme at great inconvenience or cost to faculty members. The implications of budget and remuneration are particularly sensitive and staff within a faculty may have conflicting reasons for wanting an evaluation to take place.

Wilkes & Bligh (1999) have identified 4 general approaches to medical education evaluation which are strongly influenced by and overlap with Kirkpatrick's 4 stages. This also demonstrates that the literature pertaining to programme evaluation in general terms can be applied to medical education evaluation. The first approach is

student orientated and Wilkes & Bligh mention the feedback of medical students and house officers is important for evaluating medical curricula. The second approach is programme orientated and compares the performance of the course to the overall objectives. The third is institution orientated and usually carried out by external organisations and aimed at grading the quality of teaching. The final and most difficult approach looks at whether the intervention or innovation has had a benefit on the health of society (Wilkes & Bligh 1999). Although this thesis doesn't touch on patient outcomes, if the RMC is producing competent PRHOs then it can be assumed that patients would benefit. This thesis covers all of the above objectives. Given that educational evaluation is a complex question then the approach in this thesis seems to be the most simple. We have defined questions to use their competencies from the GMC and by using PRHOs and their educational supervisors we have got the views of people who have studied under the curriculum and people who have to assess their competencies after graduation.

Published evaluations in the medical education literature

There are a variety of studies in the literature which have sought to evaluate different aspects of medical curricula. Some studies focus on individual aspects of the curriculum, for example looking at introduction of communication skills training (Yedidia *et al* 2003) (Van Dalen *et al* 2002) on student ability, others have looked at students' attitudes to studying in the community (Howe 2001) (Williams *et al* 1999) or the acquisition of clinical skills (Issenberg & McGaghie 2002) (Tucker *et al* 2003) (du Boulay & Medway 1999). Others have looked at the impact of interprofessional education (Pittilo & Ross 1998) for example. There are many of these reports in the

literature (too many to mention here) which look at different aspects of medical curricula and all in their own way relate to curriculum evaluation. All of these individual aspects are examined within the hypothesis of this thesis. By looking at the individual competencies of Liverpool graduates in communication, clinical skills, teamwork etc and the views of the graduates and teachers on curriculum reform it is possible to answer those more specific kinds of questions alongside the overall aims of the thesis. These areas are covered in detail in the discussions in chapters 7, 8, 9, 10 and 11.

Other projects or papers more relevant to this thesis have focused on looking at the “outcomes” product of the curriculum and tried to ascertain what the influence of a medical curriculum was on competencies after graduation. Questionnaires were sent to former medical students in Finland 10 years after graduation asking them to judge the influence of their medical school in preparing them for professional practice (Hyppola *et al* 1996, Hyppola *et al* 2000, Hyppola 2002). These studies looked at differences in specific skills between graduates of the traditional medical schools and the newer medical schools opened in the 1970s which comprised community based medical education and integrated science teaching. They found that community oriented teaching better met the needs of practising physicians. The University of Linköping, in Sweden (Antepohl *et al* 2003) also conducted a questionnaire survey of their graduates looking at the impact of the introduction of their PBL curriculum which was introduced in 1986. Graduates were sent a questionnaire up to 7 years after graduation to find their views on the quality undergraduate education in preparing for their roles as professionals, but also asked about any research they have undertaken, further qualifications and their success in applying for posts.

In the UK, The University of Aberdeen distributed questionnaires to 5 cohorts of graduates 4 years after asking respondents to assess which subjects they felt were most successfully taught (Richardson 1980a, 1980b, 1983) at medical school and were most relevant for their current practice. They also wanted to find out how satisfied they were with their current positions in relation to their undergraduate training. The Oxford Careers Medical Group regularly survey UK graduates looking at the impact of medical school on career choice (Goldacre *et al* 1999, Lambert *et al* 2006), as does the British Medical Association (BMA) (BMA 2004).

Perhaps fewer studies than expected have focused on the competencies of graduates in the PRHO year. The University of Manchester have been involved in a similar study to this project when looking at their reformed medical curriculum (Jones *et al* 2001, Jones *et al* 2002, Willis *et al* 2003, O'Neill *et al* 2003, Jones *et al* 2006). They held interviews and distributed questionnaires to the last cohort of their traditional curriculum (1998 graduates) and with the first cohort of the reformed curriculum (1999 graduates). They found that curriculum reform could produce graduates with different competencies and who were better prepared for the role of PRHOs. Other papers have looked at the influence of medical school on the PRHO year, although not in as much detail as the University of Manchester. Interviews have been held with PRHOs in General Practice (Thistlewaite & Van der Vleuten 2004) looking at their competencies in general practice. Guys Hospital in London evaluated their new final year programme and how it prepared students for the PRHO year by interviewing a sample of students during the final year and within the first 2 months of their PRHO post (Lempp *et al* 2004).

Other studies have attempted to determine whether undergraduate medical curricula in Australia provided junior doctors with necessary competencies for their intern year, which is the Australian equivalent of the PRHO year (Rolfe *et al* 1995). The University of Cape Town assessed newly qualified medical graduates from a traditional programme using OSCE stations on examination and practical procedures and found that the undergraduate curriculum was not providing necessary preparation for that year (Burch *et al* 2005). Some studies have looked at the specific skills of PRHOs or interns such as communication skills (Cantwell & Ramirez 1997) or basic clinical skills (Fox *et al* 2000), or general clinical competencies (Hill *et al* 1998). In Ireland there was a study to determine which clinical skills were not being effectively taught at undergraduate level (Hannon 2000). Some authors in North America have looked at the effectiveness of different types of curricula in the ability of medical graduates to pass national licensing exams (Kaufmann & Mann 1998, Kauffman & Mann 1999, Blake *et al* 2000) allowing graduates to take their first postgraduate jobs. These North American studies will be discussed again in the section about the literature surrounding the evaluation of PBL curricula (see pages 63 - 75 below).

There are other projects looking at different aspects of the curriculum in Liverpool. For example an extensive three year project examining the final year and the RITA system is still in progress (Chamberlain 2001, Fewtrell 2007), initial evaluation looking at the Clinical Skills Resource Centre (Bradley & Bligh 1999), a study looking at the attitudes of first year students towards PBL has taken place (Maudsley 2001, 2003) and an initial evaluation of the first years of the curriculum took place (University of Liverpool 1999). Students regularly give feedback on their clinical attachments and on the performance of their PBL tutors through questionnaires. The

learning styles of the first two cohorts to enter the RMC were assessed when they were first years (Lloyd Jones 2002, Lloyd Jones & Hak 2004). Work has also been undertaken at Liverpool Dental School to see if the introduction of PBL into the first 2 years of undergraduate dental education has affected basic science knowledge levels. (Last *et al* 2000, Last *et al* 2001).

Evaluation of PBL

The next section concentrates on the literature surrounding the impact or effectiveness of PBL. This thesis is about more than evaluating a PBL-based medical curriculum.

The introduction of PBL in Liverpool was just one part, albeit a very important part of curriculum reform. However, all the other components of the curriculum fit in around PBL. Many institutions, like Liverpool, have also used the introduction of PBL to re-write their curricula, integrate science teaching and introduce communication and clinical skills training alongside PBL. Evaluation of the effect of PBL has dominated medical education literature over the last few years and the term PBL is often used to describe medical curricula as a whole. The implication is that these curricula will have integrated teaching, early clinical exposure, student self-selected components for students or have an increased amount of community-based teaching.

Inevitably, there are some overlaps between this section and the literature discussed in the previous pages as they are all concerned in some way with “outcomes” from the curricula, usually attempting to look for professional competencies after graduation, any changes in learning styles of whether teachers, students are satisfied with the

curriculum and how the introduction of a PBL curriculum has impacted on the competencies of graduates. The author has used his discretion to select some of what he considers the more interesting and relevant studies for this section. Many of the papers about PBL see themselves as looking at the impact of PBL, not curriculum evaluation as such, even though it can be argued that is what they are engaged in.

As has been outlined in the introduction, one of the principle aims of introducing PBL into a medical curriculum has to reduce “factual burden” in teaching basic sciences and integrate this teaching to make it more relevant for clinical practice. However, it has been suggested that some PBL students score lower in basic science tests and feel they have less knowledge in the basic sciences compared with traditionally educated counterparts. It has also been suggested that PBL graduates engage in backward reasoning rather than the forward reasoning which experts would undertake and there could be gaps in cognitive knowledge which may affect their ability to work as doctors (Barrows 1986). PBL may inhibit teachers from sharing their enthusiasm for the topic and student identification with good teachers and students may fail to develop an organised framework for their knowledge (Davis & Harden 1999). PBL does encourage students to set their own learning goals and although this is an advantage it can lead to uncertainty over knowledge. Students may feel concerned that they do not know how much self directed study is necessary and areas need to be covered in more detail than others (Wood 2003). Mifflin *et al* (1999) have said that students encounter considerable stress in the first two years of a PBL curriculum and even in the latter years of PBL curriculum are likely to encounter concerns over what depth of science knowledge should be learned. Norman & Schmidt (1992) say that there is little evidence that PBL curricula may result in general, content free problem-

solving skills which has also been shown by review of the literature in 2006 (Baig 2006). However Norman & Schmidt (1992) also say that although PBL may also initially reduce levels of learning but may foster over a period of several years increased retention and integrate basic science concepts into clinical ones. In North America in particular the evidence is mixed over this and certainly not conclusive that the introduction of PBL will see a decline in levels of science knowledge.

Vernon & Blake (1993) undertook a meta analysis of 35 studies over 19 institutions found that PBL and traditional students did not differ on miscellaneous tests of factual knowledge or clinical knowledge, but in North America, PBL graduates did significantly better on part 1 National Board of Medical Examiners. Kauffmann & Mann (1999) conclude that the performance of PBL and conventional students is equivalent after medical school and during postgraduate education, although there are initial differences in favour of traditionally educated students after the first two years of medical school. Although it has been shown that second year PBL students had more positive attitudes towards basic science teaching than traditional students as the science is learned in the context of clinical problems. (Kaufman & Mann 1997). Using the Canadian licensing exam as the benchmark it was found there were no major differences except the PBL graduates were stronger on psychiatry and community medicine (Kaufman & Mann 1998). Another study using the results of the step 1 and 2 licensing exams in the US show that overall the traditional graduates had higher mean scores over the 7 year period, but these weren't significant (Enarson & Criaga-Lo 2001).

When the Missouri-Columbia School of Medicine compared their new PBL curriculum (97, 98, 99, 2000) cohorts with the last of the 2 classes to learn in the traditional curriculum, matriculation data for all 6 cohorts were analysed. The mean scores were higher on USMLE step 1 and step 2 from the PBL graduates compared with those from the traditional course. The admission profiles of these classes were essentially the same before and after the change in the curriculum so introducing PBL did not compromise the performances of medical students on the licensing examinations and may have contributed to an improvement (Blake *et al* 2000). In Australia, the graduates of the Universities of Sydney (traditional) and Newcastle (PBL) students were examined on multiple choice and 2 essay questions which had a primarily internal medicine content. The Sydney students were dictomized into high and low scores whilst the PBL ratings were broadly similar around the average with fewer scores at the higher and lower range (Saunders *et al* 1990). Alleyene *et al* (2002) found that West Indian PBL students did not differ from their traditional counterparts in basic science exams and in some clinical components scored better and Khan & Fareed (2000) demonstrated that PBL students scores on biochemistry did not differ from traditional graduates

Nandi *et al* (2000) conducted a meta analysis using a *Medline* literature search of papers from 1980 – 1999 which compared the results from traditional and PBL curricula in terms of programme evaluation, academic achievement, graduates performances and attitudes and practice characteristics. They found in their literature search that whilst PBL curricula had advantages in terms of student enjoyment and showing psychosocial knowledge traditional students performed better on basic science tests. Other studies have also shown that students and faculty prefer the PBL

approach to medical education (Kahn & Fareed 2000, Al – Damegh & Baig 2005 Baig 2006).

Peters *et al* (2000) evaluated the long-term impact of the New Pathway (NP) Program, on behaviours and attitudes related to humanistic medicine, lifelong learning, and social learning at Harvard Medical School. The NP programme, a pre-clinical curriculum using PBL, was introduced in 1985. A descriptive study was undertaken involving telephone interviews with 1989 (traditional) and 1990 (NP) graduates. Attitudes were measured on the on 0-10 scales (total disagreement to total agreement with 5 being totally neutral). Of 22 measures in the survey, NP PBL and traditional curricula students differed significantly on 5 measures. NP students rated their preparation to practice humanistic medicine higher than “traditional” students, but otherwise there were few significant differences.

Remmen *et al* (1999) have published results of a survey involving 2 traditional medical schools at Ghent and Antwerp and the PBL curriculum at Maastricht. A questionnaire was developed using basic clinical and locomotor skills which students require for the clerkships and was distributed to the students at the 3 institutions. Ghent and Antwerp students reported fewer competencies in skills compared with the Maastricht students. The difference between the faculties suggest that a PBL learning environment, skills laboratory training and assessment of clinical skills during pre-clinical years prepare students more effectively for performing skills, and that continuous evaluation of clerkships may enhance this effect. Also, in the Netherlands another study comparing graduates from a PBL and a non PBL curriculum through administering questionnaires 18 months after graduation, found PBL graduates gave

higher ratings for their medical training and preparation for practice, communication skills and teamwork (Prince *et al* 2005). Gurpinar *et al* (2005) showed that PBL students in Turkey have improved knowledge of public health. These studies all demonstrate the point that the introduction of PBL into a curriculum is often accompanied by further reforms to the curriculum which can result in improved clinical skills training or teaching of public health, for example.

Another reason for the introduction of PBL alongside reducing the “factual burden” was rather to encourage students to engage in deeper learning rather than just for short term gains to pass exams (Nuefield *et al* 1989). Whether it has produced self-directed learners is hard to quantify and this thesis will look at this issue relating to Liverpool graduates in chapters 8,9 and 10. It has been found that second year PBL students at Harvard were less orientated towards memorisation and more towards studying by reflection (Moore *et al* 1990). Nolte *et al* (1988) studied the effects of PBL on biology and found library use of reserve books increased 20 fold, which continued into the clinical years. At The University of New Mexico comparisons were made between the study times of 10 PBL and 10 conventional curriculum students. In their first year the PBL students spent on average 9.76 hours a day studying, the latter 7.15. Blumberg (1992) when examining a relatively structured form of PBL found that, compared with their conventional curricular peers, PBL students report greater use of textbooks, journals, books and are more likely to engage in informal discussions with faculty staff and peers. Other studies have shown PBL nursing students reported higher levels of critical thinking compared with traditionally educated nursing students (Tiwari *et al* 2006). There is also some literature to show that PBL students retain knowledge from tests better than conventional students (Coulson 1983, Eisenstaedt *et al* 1990). There

is also evidence that PBL can improve the analytical thought process of students (Baig & Assad 2003). Therefore some studies appear to be quite positive suggesting that PBL students are more likely to study for understanding, not short term gain.

Some assessments on the thought processes used by students in different curricula use cognitive psychology methods. Claessen & Boshuizen (1985) compared the recall and reasoning processes of medical students at different levels of training using 21 PBL students at Maastricht and 26 at Utrecht. All students were shown 2 cases with one being classic in characteristics, the other atypical. The students were analysed over ability to recall and identify important information, their ability to create an accurate diagnostic differential, the amount of time taken to achieve this and the relevance of statements made in commentary on their decision making progress. The PBL students did have greater recall for the atypical cases, but less recall for the “classic” cases.

There was no difference in the error rates between the 2 groups, however 5th year PBL students were three times more likely to include irrelevant material from either an earlier case or the practice case. Again, the results are mixed from this study and the irrelevant information offered by PBL students could be due to the perceived lack of structure in a PBL curriculum. Patel *et al* (1991) compared the reasoning processes of volunteer students at the University of McMaster using 54 PBL students and 54 conventional students. Senior PBL students were less decisive in reaching a diagnosis and relied more on backward reasoning than forward reasoning compared with conventional students. One leading author on PBL believes that reviews show that students themselves feel they are more likely to study for understanding rather than for memorization in a PBL curriculum (Norman 2004).

Assessment of whether or not PBL itself makes “good doctors” is still at early stage, particularly in Europe and in fact some will argue that there is no definite proof that it does produce “better doctors” and that basically PBL “doesn’t work” (Colliver 2000, Newman 2004). Smits *et al* (2002) believe there is at best limited evidence that PBL will facilitate lifelong learning skills, increased knowledge and improvements in patients’ health. Many of the major studies, though, do show that the evidence is inconclusive about PBL (Norman 2004), in particular whether it does improve knowledge level and retention or encourage self-directed learning or that graduates can answer questions that test “higher order” thinking (Cunnington *et al* 1996).

Woodward *et al* (1988 , 1990) indicate that PBL graduates spent more time in direct patient care, had fewer patients per month and billed for more psychotherapy services per month and requested fewer onward services. There was also a trend for PBL graduates to earn less per month and to have higher costs per patient and be more likely to look at psychological issues. There is also a pronounced trend for PBL curricula to produce graduates who are more likely to subscribe to journals (Tolnai 1991). It has been shown that PBL students do like some guidance to go along with their learning resources (Mifflin *et al* 1999, Te Winkel *et al* 2006). Medical students at Linköping, Sweden who have undertaken PBL are more likely to want to combine practice with research after graduation. This is particularly encouraging at a time when it is thought that the number of doctor-scientists currently being trained will be inadequate to support the need for advances in biomedical research (Dahle *et al* 2002). Studying under the PBL curriculum at Linköping has had beneficial effects on students’ careers after graduation (Antepohl *et al* 2003). PBL students have also been shown to work better in teams (Schmidt *et al* 2006), have a wider understanding of

what constitutes a team (Willis *et al* 2003) and the small group PBL process can promote constructive, collaborative learning (Dolman *et al* 2005).

Colliver (2000) concluded that there was no major evidence that PBL was any more effective than conventional methods and the literature reveals no convincing evidence that it can improve knowledge base and that in effect it uses many resources not to have made improvements in this area. Norman & Schmidt (2000) and Albanese (2000) both challenge this. They say that PBL students on knowledge tests perform no better or worse than traditional students and there are recognised short improvements in the clinical skills of PBL students.

Norman & Schmidt (2000) and Albanese (2000) do say is that it is irrefutable that PBL curricula are more challenging, motivating and enjoyable than traditional curricula and this is clear, even in the papers which are sceptical about the benefits of PBL. PBL can enhance intrinsic interest in the subject matter which can make it more enjoyable for students (Norman & Schmidt 1992). That doctors are satisfied with it is an important and continuous theme in the literature. In fact what is clear in the literature is that curricula containing PBL learning can be enjoyable. Albanese & Mitchell (1993) believe that the literature shows PBL is more nurturing and enjoyable than more traditional curricula and that PBL candidates perform as well if not sometimes better on clinical examination but PBL curricula always score high on faculty evaluation. It has been suggested that class attendance, student and staff satisfaction is higher under a PBL curriculum (Vernon & Blake 1993). Other studies have shown that even when basic science knowledge level did decline with the introduction of PBL this was offset by the fact that students enjoyed it more and had

better attitudes to their patients (Nandi *et al* 2000). It can, generate a more stimulating and challenging educational environment (Wood 2003). PBL students can also be less stressed than conventional students (Moore-West & O'Donnell 1985) and enjoyment of the learning can compensate for perceived gaps in knowledge (Davis *et al* 1992). Interviews with Harvard students show they are more likely to enjoy their pre-clinical years than their traditional counterparts (Moore *et al* 1990). Faculty satisfaction for example is often cited as a strength of the McMaster curriculum (Woodward 1990). In the UK, one of the few studies to look at PBL in the clinical setting found that of the PBL tutors, 97% were happy with their classes and the majority would recommend it to a colleague. (O'Neill & Baxter 2000).

All teaching methods are more successful if the student is motivated to learn (Katona 1940). Some reports suggest students are more motivated to learn using PBL and have more favourable attitudes towards their environment, social issues in medicine and their curriculum. (Kaufman & Mann 1996). Students in the developing world also favour PBL. A PBL curriculum was instigated at the newly established Institute located in Dharan, Nepal. During a period of about 18 months, students in phase 1 were given 8 PBL sessions of 6 days duration each. At the end of each PBL block students were given a questionnaire in order to obtain their feedback on the effectiveness of the PBL block they had just completed. It was anonymous and consisted of 8 points including, relevance of teaching content, learning from fellow students, group discussions, and tutor guidance. Nearly all the students gave positive feedback (Bhattacharya 1998).

Many of the studies listed above are from North America, but there are evaluations of PBL from around the world in the literature. It has been argued that some of the randomised control trials about PBL have flaws in the way they present their conclusions (Norman 2003) and that it is almost impossible to assume any problem solving strategy will be consistently superior to any other kind of strategy (Norman & Eva 2003). There should also be some caution about evaluating PBL as there is not a uniform intervention named PBL and as it contains multiple components it can be translated in different ways in different institutions (Mamede *et al* 2006, Newman 2006). Despite the differences in the literature the role and function of PBL has been better understood by the various research projects which have taken place with PBL (Mamede *et al* 2006). Certainly there are plenty of studies listed above showing that PBL hasn't had an adverse affects on students' learning. What is noticeable is the lack of literature evaluating PBL in a UK setting. This may be due the small numbers of medical schools which have employed PBL as the principle learning tool and because the results of any curricula evaluations in UK schools may not be available until after the submission date of this thesis. Whilst it has been seen that students in North America, Scandinavia and elsewhere have enjoyed PBL the views of UK students on studying under a reformed curriculum incorporating PBL have yet to be published. There have also been no publications (at the time of submission) on the views of PRHO and student supervisors on a RMC which includes PBL in the UK – and this is one of the aims of this work.

This chapter has considered some of the literature surrounding curriculum evaluation, problem-based learning and outlined the arguments for using quantitative and qualitative research methods. There is less use of qualitative methods in the literature,

but arguably there is still more of a tradition of quantitative rather than qualitative research in medical education. It has been shown that the use of qualitative methodology is valid and certainly combining focus groups and interviews as this thesis does is a novel approach to curriculum evaluation. There is a wide of variety of literature pertaining to “curriculum evaluation” and no set way to evaluate a curriculum and it is possible to focus on different parts of a course.

However, it is an accepted method to look at the influence of the medical curricula on the competencies of doctors working after graduation. The most popular method seems to be using questionnaires on graduates or students, but other methods include examining skills in OSCEs, interviews or looking at examination performances or asking their supervisors to assess their performances. The literature also shows that many studies measure the competencies of traditional graduates prior to collecting data – again an approach which has been taken for this work.

In a way this thesis is focused on a combination of these measures and all areas of the RMC are covered by the approach taken in this evaluation. It is concerned with the competencies of Liverpool graduates as PRHOs, but it relates this to the individual parts that make up the curriculum both in the competencies and in the views of PRHOs and their trainers of the content of the reformed curriculum. This chapter has also demonstrated it is possible to use a wide variety of research methodologies for evaluating a medical curriculum. However although this thesis is grounded in the evaluation/medical education literature and is influenced by other studies the actual research undertaken is unique. The research methods are looked at in more detail in the next chapter.

Chapter 4. Methods

This chapter will examine the three research methods used in this thesis; the questionnaires; focus groups and interviews. It will look at the rationale behind using these methods and how they integrate with each other. The chapter also looks at how the questionnaires were distributed and how the focus groups and interviews were arranged. Finally, it will describe how the questionnaires and qualitative data has been analysed.

Questionnaires

In order to gather some quantitative data on the skills and attitudes of the study population, questionnaires were delivered to the PRHOs and their Consultant Educational Supervisors. The term “questionnaire” can be used in different ways. Some writers suggest questionnaires only include self-administered and postal questionnaires, whilst others would include some forms of interviews under the general term “questionnaires” (Oppenheim 1996). These would be the more structured interview schedules with “definitive check-lists” and which require short answers and often include telephone interviews. For the purposes of this work the term refers to the self-administered and postal variety. There are certain characteristics that run through all kinds of questionnaires - they generally contain check-lists, attitude scales, projective techniques or rating scales . As Oppenheim writes of questionnaires: “A questionnaire is not some sort of official form, nor is it a set of questions which have been casually jotted down without too much thought. We should think of a questionnaire as an important instrument of research, a tool for data collection. The

questionnaire has a job to do and its function is measurement” (Oppenheim 1996 page 100).

If questionnaires are posted, this can reduce the bias and lessen the influence of the researcher. Also, if they are posted to an individual to complete in their own time the results are less likely to be influenced by others, again reducing the bias (Bryman & Cramer 1990). As has been illustrated in the previous chapter mailing questionnaires to students or graduates asking them to evaluate their curriculum or part of their curriculum is one of the most popular evaluative tools in the medical education literature. Ideally, questionnaires should be piloted and validated (Frazer & Lawley 2000). The questionnaires were piloted on the 1999 cohort graduates from Liverpool and the Mersey Deanery consultants who supervised the 1999 cohort – the penultimate cohort from the TMC (Watmough *et al* 2002, Watmough *et al* 2005 b). These demonstrated that a majority of supervisors would be prepared to take part in the data collection for this thesis and that they felt they would be able to judge the majority of skills on the questionnaires. The questionnaires were based on those used Jones *et al* (2001, 2002) giving the questionnaires in this thesis further validity. Although the results from the 1999 cohort are not formally included in this thesis, these results have been published elsewhere (Watmough *et al* 2005a, Watmough *et al* 2006a, Watmough *et al* 2006b) and the results will be referred to in chapter 7 which discusses the questionnaire results.

The study population for the questionnaires comprises three cohorts of PRHOs and their educational supervisors. Two versions of the same questionnaire were used. One version was for the PRHOs themselves, the other for their educational supervisors. It

has already been discussed in chapters 1 and 2 that the GMC laid out the competencies expected of PRHOs in *The New Doctor* (1997). The questionnaires contain the skills and competencies illustrated by the GMC in *The New Doctor* (1997) and consist of 31 variables. Therefore the variables are the key skills and attitudes which the GMC expects UK graduates to have when they qualify as doctors (i.e. graduation) and embark on the pre-registration year. *The New Doctor* lists specific skills such as “venepuncture” or “urinary catheterisation”, with broader areas of competence such as “keeping accurate records” or “being aware of limitations” and general attitudinal themes such as “providing care for people of different cultures”.

Although there is no interviewer bias in questionnaires it is always possible that the respondent may see some bias behind the content or who sent the questionnaire (Oppenheim 1996). Using GMC guidelines rather than University goals may have reduced the bias in the eyes of the respondents as the PRHOs were assessed on national standards, rather than the specific Liverpool guidelines. Quantitatively measuring their perceived ability to undertake these tasks is an effective way of assessing the effectiveness of undergraduate education anyway as the goal of undergraduate medical education is to produce competent PRHOs. Also, it is important to remember that as they contain the skills of the *The New Doctor* both supervisors and PRHOs should be familiar at assessing and being assessed on these skills. The Postgraduate Dean has to be satisfied that PRHOs are competent enough for full registration with the GMC at the end of the PRHO year. The Liverpool PRHOs are assessed on the skills on the questionnaire by their educational supervisors through the Mersey Deanery portfolio. As has been discussed in chapter one, using

GMC guidelines rather than the University's own guidelines make the results relevant for a wider audience.

The PRHO questionnaire (Appendix A) began with a "general" question "Overall, how well prepared were you for the PRHO year?" with a following 5 point Likert scale ranging from "generally very well prepared" to "generally not at all prepared" with "generally quite prepared" as midpoint. The Consultant questionnaire (appendix B) started with the "general" question worded "Overall, how well prepared are the Liverpool graduates you supervise for the PRHO year?" followed by the same 5 point Likert scale as applied to the PRHOs.

The PRHOs were then asked "Please rate yourself on your competence in the following....".with the 31 skills and competencies taken from *The New Doctor* as described on the page above. The supervisors on their questionnaire were asked "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.

Both PRHOs and supervisors were asked to rate their answers to the 31 New Doctor variables on a 5-point Likert scale ranging from "generally very competent" to "generally not at all competent" with "generally quite competent" as the midpoint. A Likert (Likert 1932) scale was used to allow the results to undergo statistical testing and it would be then be easy to present a snap shot of the results using percentages

from the results. It was possible to gain an insight into the initial results or the way the other research was going before the more time consuming analysis of the focus groups and interviews. In recent years it has been questioned whether Likert scales and the use of 5 point scales is valid for this type of medical education research (Jamieson 2004) as there is no guarantee that the intervals between the values can be presumed equal (Blaikie 2003). Likert scales are commonly used to measure attitudes and the questionnaire variables are “attitudinal” in that the supervisors are PRHOs are very much responding on the basis of perception of competency. Also, as Knapp (1990) points out sample size and the distribution of results are equally important factors in determining whether it is appropriate to use parametric statistics. The Mann Whitney tests (explained below) which have been used to analyse this data have been used to highlight trends between the cohorts. The questionnaire results in this thesis (Watmough *et al* 2006 a, b) have been highlighted in a systematic review on the effects of PBL as being of high quality (Choon-Huat Koh *et al* 2008). Using a 5 point scale with a midpoint may have encouraged people to go for the mid scale it was felt that they needed to be given that option. (Likert 1932) scales are recommended for this approach when the aim of the questionnaire is for assessments on attitudes and competencies (Worthen *et al* 1997).

For the purpose of this thesis and ease of presentation the questionnaire results have been condensed 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 12.0 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. Mann Whitney tests (named after an Austrian born mathematician Henry Berthold Mann and US statistician Donald Ransom Whitney) involve combining the score from two groups (in the case of the questionnaire data here traditional and reformed curriculum graduates), ranking them and then calculating the statistic (U) which is the number of times a score from the second group precedes a score from the first group in the ranking. The data in these questionnaires is classed as non-parametric as they are used to test the significance of samples of scores that represent at least the ordinal measurement. The test requires the two samples to be independent, and the observations to have continuous measurements, i.e. one can at least say, of any two observations, which is the greater (Corston & Colman 2003). It also requires similar sample sizes – and the questionnaires certainly meet all these criteria. Generally, Mann Whitney tests the null hypothesis that the probability of an observation from one population exceeding an observation from the second population is generally taken as 0.5. Although studies (Jones *et al* 2002) have only tested to 0.1 it was decided for the data in this thesis to use 0.5 as the standard for testing so it would be easier to identify the differences between the questionnaire cohorts. The tests were carried out between the results of the different cohorts of PRHOs and the educational supervisors. It was not valid to test for significant differences between PRHOs and supervisors as the wording on the questionnaires was slightly different. Also, the supervisors were making their judgements on more than one PRHO at a time.

At the end of the questionnaire space, was allowed for the respondents to write free text comments. The PRHOs were asked “*Please add any further comments or suggestions in relation to how well prepared you are for your role as a PRHO.* For

the supervisors: *“Please add any further comments or suggestions in relation to how well-prepared the Liverpool graduates are for their role as a PRHO.”* Both PRHOs and supervisors had the option of indicating whether their comments referred to skills, attitudes or knowledge, although not all of the comments were specifically designated as such. These comments were typed up into a Microsoft Word document for analysis according to whether they belonged to knowledge, skills, attitudes or any other (miscellaneous) category (see chapters 5 and 6).

Distribution of questionnaires

The list of educational supervisors and PRHOs was gathered from the Mersey Deanery for the following hospital trusts: University Hospital Aintree, Countess of Chester, North Cheshire, Royal Liverpool and Broadgreen University, Southport and Ormskirk District General Hospital, St Helens and Knowsley, Wirral Hospital, The Royal Liverpool Children’s Hospital. Any graduates working in the Mersey Deanery who weren’t Liverpool graduates were excluded from the process as the lists stated clearly which medical school the PRHOs had graduated from. The Mersey Deanery Educational supervisor lists gave the name of the supervisors and rotations per hospital, not whether they supervised Liverpool graduates, so all supervisors were sent the questionnaire but asked in the covering letter and on the questionnaire only to complete the questionnaire if they had supervised Liverpool graduates that year (see appendix C).

PRHO questionnaire distribution

Questionnaires were at first distributed in an identical manner for all three cohorts. A questionnaire with covering letter (see appendix D) was posted to the PRHOs' hospital addresses in the May of each year the questionnaires were delivered (2001, 2002 and 2003 for the 2000, 2001, 2002 cohorts respectively). In the first week of June, questionnaires were given to the postgraduate centre managers to distribute when PRHOs attended formal teaching. Finally, in the last week of June, a final distribution via post to their hospital addresses took place. Stamped addressed envelopes (SAEs) were used at all times so the PRHOs would incur no costs returning the questionnaires. All questionnaires were made anonymous to encourage participation. It is also important to note that the questionnaires were distributed to the PRHOs at the same time as questionnaires from the Mersey Deanery which was working on a project examining the factors affecting teaching and learning in the PRHO year (Brown *et al* 2003, Brown *et al* 2004, Brown 2005). Although, this in effect doubled the length of the questionnaire it was decided to deliver a joint distribution as both projects were looking to collect cohort-specific data and it was feared that distributing them separately would have done more harm to the response rate.

Consultant Educational Supervisors

The list of PRHO educational supervisors for each hospital trust in the Deanery area was gained from the Mersey Deanery. The questionnaires for the supervisors of the 2000, 2001 and 2002 cohorts were distributed along with a covering letter (see

appendix C) in May 2001, 2002 and 2003 to the relevant trusts. A follow up letter questionnaire for each sent towards the end of June for each supervisor cohort. When the reminder letter was distributed the supervisors were given the opportunity to return the questionnaires not completed in the SAE if they were one of the small numbers of educational supervisors in the Mersey Deanery who had not supervised Liverpool graduates in those years.

The questionnaires to both supervisors and PRHOs were sent towards the end of the PRHO year. There are advantages and disadvantages to this and the issues surrounding the response rate and the timing and method of distributing questionnaires are discussed in more detail in chapters 5, 6 and 7. The reason for later distribution was so that for the supervisors in particular they would have received their full quote of PRHOs for year and that the PRHOs would have been rating their competencies after undertaking both medicine and surgery attachments.

Focus Groups

A total of thirteen focus groups were held with PRHOs. Four were held with the final cohort of the traditional curriculum, five with the first cohort of the reformed curriculum and four with the second cohort to graduate from the reformed curriculum. They were held during protected teaching time in the postgraduate centres in a combination of teaching hospitals and District General Hospitals.(DGH). For the 2001 and 2003 cohorts they were held in two DGHs and two THs, for the 2001 cohort two were held in THs, 3 in DGHs. The hospitals used to carry out the focus groups were

chosen because they are the closest to the University with the largest numbers of Liverpool PRHOs.

The aims of the focus groups were to ask the PRHOs how well prepared they were for the PRHO year and what their views on their undergraduate curricula were. The questions and themes of the focus groups and their location are covered in chapter 8.

Judging from the literature it seems that focus groups are an underutilised method of evaluating a medical curriculum, and only a few studies have used them. For example in the UK they have been used to ask PRHOs about their views on appraisal as part of their education (Friedman Ben-David *et al* 2004) and undergraduate students' perceptions of factors affecting learning in the clinical settings (Stark 2003), Canadian students' perceptions of professionalism (Ginsburg *et al* 2005) and for postgraduate medical education (Verma & Seguin 2005) but there is nothing in the literature pertaining to the use of focus groups in an overall evaluation of an undergraduate medical curriculum in the UK.

Focus groups were originally used by market researchers and North American politicians and they became popular with British politicians in the UK in the 1990s. Since that period they have become more popular in academia and during the 1990s there was a three fold increase in focus group papers in academic journals (Barbour & Kitzinger 1999). Focus groups are group discussions exploring a specific set of issues and explore participants' feelings, experiences, wishes and concerns (Barbour & Kitzinger 1999). They can be used either as a self-contained method, a supplementary source or part of multi method where no method has primacy over others (Morgan

1997) and can be used alone or to clarify quantitative data (Barbour & Kitzinger 1999, Morgan 1997, Frankland & Bloor 2001) or triangulate other qualitative research (Morgan & Krueger 1993). The distinguishing feature of focus groups is that they collect and observe interaction between participants. They uncover not only what the participants think but the reasons why they think that way (Barbour 1995). They explicitly use group interaction as a method of generating data and during the groups participants are encouraged to talk to one another, ask questions, exchange anecdotes and comment on each others' experiences and viewpoints (Kitzinger 1995). They are particularly appropriate if the researcher has some open ended questions which require discussion in the group (Kitzinger 1995) and are seen as a "friendly" research method which can offer real insights into the topic under discussion. (Morgan & Krueger 1993). For any programme evaluation focus groups are useful for clarifying program outcomes and how participants have gained from a programme and how it could be improved (Worthen *et al* 1997).

PRHOs are a particularly good group to hold focus groups with. Focus groups are at their most effective when there is a defined area of interest with the participants and that participants (Kruger 1997) should have shared experience (Morgan 1993). There was a defined area of interest for the PRHOs and shared experiences, in that they had undertaken the same medical curriculum and worked as PRHOs in the same hospital. Focus groups can also be a tool to listen to large number of people in a short space of time (Reed & Payton 1997). There was a need to undertake all the research on the PRHOs within a certain time before the end of the PRHO year, whilst collecting data from the supervisors. The PRHOs had no office or secretaries so it would have proved a monumental task to interview as many PRHOs as took part in the focus groups.

Focus groups are particularly good for participatory evaluation, particularly if there is a differential between the participants and the decision makers or managers. (Shaw 1999). The PRHOs had no input into the curriculum and obviously had a different view of the curriculum to teachers or curriculum designers.

The focus groups took place in an environment where the participants were comfortable and there was no one in authority present during the groups (Kitzinger 1995). It is better that someone known to the participants shouldn't be present (Worthen *et al* 1997). 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 and the PRHOs were made aware of his position within the university to reduce the chance of bias in the discussions (Norris 1997).

As has been outlined in chapter one, PRHOs have to attend a pre-determined amount of "protected" teaching in hospital postgraduate training 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. It was felt that using protected teaching time would 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. It has been recognised that 3-5 focus groups is enough to gain a saturation of themes with a homogenous group of participants (Morgan 1997), which was borne out in this study where no new themes came up after the first two focus groups in each cohort. Only a very small number of the PRHOs knew prior to attending that focus

groups were taking place, but did not 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 two distinct research questions we wanted the focus groups to discuss. We wanted to know how well their curriculum had prepared them to work as PRHOs and what they felt about the content and structure of the new course and felt a group discussion with people who had all experienced the curriculum would deliver rich data (Morgan 1997) about the curriculum. They 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.

Interviews

The final research method in this thesis is a collection of interviews that took place with the consultant educational supervisors. The primary aim of the interviews was to ask the supervisors about the competencies of Liverpool graduates they supervise and what they felt about curriculum reform in Liverpool and the content of the reformed curriculum. The interviews were also useful to assist in explaining some of the questionnaire data and see which of those skills were most relevant in the eyes of the PRHO supervisors. It gave the opportunity to discuss curriculum reform in detail and ask why the PRHOs from the reformed curriculum will have the competencies they have. Two distinct groups of interviews are reported in this thesis. Thirty eight interviews took place in 2002 with supervisors, who had worked with one cohort from

the RMC, 16 interviews took place with consultant supervisors who had worked with two cohorts of RMC graduates in 2003. A group of pilot interviews which aren't included in this work were carried out with 23 supervisors in the summer of 2001, prior to PRHOs from the RMC graduating.

Why use interviews?

It was felt that interviewing the supervisors would gather richer data on their views of the PRHOs (Kvale 1996). Kvale (1996) also notes that interviews are basically one person (the researchers) gaining in depth views. "An interview is literally an *inter view* (original italics), an inter change of views between two persons conversing about a theme of mutual interest." Arranging focus groups between the supervisors was not a possible given the differing working commitments of consultants. Also, some consultants have more seniority than others and some may not like to disagree with colleagues in a way PRHOs were prepared to with each other. Part of the role of PRHO educational supervisors is to meet with the PRHOs themselves and other doctors or health care professionals if necessary to discuss their progress. Therefore supervisors should be used to talking about their PRHOs and be comfortable to do so in an interview situation. The pilot interviews which took place in 2001 confirmed this.

Interviews allow the opportunity for clarifying and probing and are used in evaluation when greater depth of information is needed (Worthen *et al* 1997). The questionnaire data gave some indication of strengths and weaknesses of the RMC graduates according to their supervisors and the interviews gave a chance to find out why they

felt they had certain strengths and weaknesses. They gave more “colour” to the statistics. It was possible to find out what their expectations were compared with the expectations of the GMC and what they felt were the most important attributes of a PRHO. Also, they could talk in depth about curriculum reform and the strengths of the weaknesses of the course – designing a questionnaire to find those details would have been very difficult. Interviews have also been used before to assess the competencies of graduates or students (Britten 1995, Dumelow *et al* 2000) and are an established tool in qualitative evaluation (Shaw 1999, Worthen *et al* 1997). Interviews offer flexibility to the researchers and unlike postal questionnaires; for example, questions can be explained or re-asked. The presence of an interviewer can reduce the numbers of “don’t knows” (in the interviews it was possible to find out why some supervisors had not rated the PRHOs on certain variables on the questionnaires) and greater flexibility is afforded to the respondent (Burns 2000).

The interviews were undertaken by the author of this thesis and as he had no management position within the University and was a non-clinician this should have reduced the chances of bias in the interview or at the very least limited it (Norris 1997). The supervisors were guaranteed anonymity and only the author knew who had volunteered to be interviewed. The interviews involved semi structured questions (which are listed in chapter 9) to allow any further themes to emerge and allow the supervisors to talk openly (Worthen *et al* 1997).

Practically, it proved possible to arrange interviews with the supervisors without too much difficulty. When the questionnaires were distributed for the 2002 and 2003 cohorts including the covering letter was an invitation to take part in an interview

about curriculum reform (see appendix C). Any supervisors wishing to take part in the process completed the form with contact details and returned it with the questionnaire. All consultants have access to an office and secretarial support and arrangements were generally made through their secretaries. The interviews then took place in the consultants' office at whatever trust they were based. Each interview typically lasted about 30-40 minutes. This was about the amount of time supervisors could make available and the pilot study had shown this was enough time to cover the topics.

A total of 38 interviews, about 25% of the total number of supervisors, took place in the summer of 2002 between June and September. The timing of the interviews was deliberate 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 and seen their full quota of PRHOs for the year. There was a mix of supervisors. Fifteen were arranged with surgeons, twenty three with physicians, sixteen were in teaching hospitals and twenty two in District General Hospitals with at least two supervisors interviewed from each of the seven trusts in the Mersey Deanery who take Liverpool graduates. A further 16 interviews took place in the summer of 2003. Again, these interviews took place towards the end of the PRHO year so the supervisors would have seen their full allocation of PRHOs for the year. Nine were with physicians, seven were with surgeons and they took place at 6 hospital trusts with 7 at teaching hospitals and 9 at DGHs. Sixteen represented only about an eighth of the supervisors as a whole and the criterion was that only consultants who hadn't taken part in the 2002 interviews were invited to take part. However, as the lists of supervisors for the 2001 and 2002 cohorts were broadly similar the total of 54 interviews represents

nearly a third of the hospital educational supervisors in the Mersey Deanery over a two year period.

Any limitations about the sample size, bias of interviewees or content of the sample size of both these sets of interviews will be discussed in more detail in chapter 9. In the summer of 2001 21 interviews had taken place with supervisors in a pilot study. Nine of these interviewees took part in the 2001 interviews. These interviews were ostensibly to test methodology and look at competencies of the traditional curriculum graduates prior to the reformed curriculum graduates working as PRHOs.

All supervisors interviewed had worked with graduates from the traditional Liverpool curriculum over several years. In fact the supervisors had an average of approximately 8 years as educational supervisors in the Mersey Deanery. Many of them had worked with Liverpool graduates from the traditional course when they were registrars or SHOs. It was a not specific research aim to ask them to compare and contrast traditional and reformed curriculum graduates - however all the interviewees had worked with traditional graduates and they volunteered comparisons in response to the questions.

General Practice data collection

As outlined in chapter one a small number of PRHOs were able to take a 4 month rotation in General Practice alongside medical and surgical attachments, and the views of GP supervisors on the competencies of Liverpool graduates were sought using questionnaires and interviews. As the competencies required in general practice are different to medicine and surgery, the questionnaires and interviews were slightly

different to those undertaken on hospital supervisors. Questionnaires (see appendix E), specifically designed for assessing the perceptions of competencies of the graduates in general practice, were drawn up in 2001 using the hospital questionnaire as a basic model. These were sent to the small number of GP supervisors in the Mersey Deanery. The 13 variables were taken from the GMC's "The aims of general practice training" in *The New Doctor* (GMC 1997) which lists the competencies expected of medical graduates in general practice. The questionnaires were validated by GP trainers working at the Mersey Deanery.

The GPs were asked "Please rate the Liverpool graduates on their competence in the following....." with the same Likert scale as the hospital supervisors. 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. The data was analysed using the Statistical Package for Social Sciences version 12.0 for windows (SPSS) using the same format employed in the analysis of the hospital questionnaires, although the numbers were too small to allow meaningful statistical testing. The distribution of questionnaires was undertaken in the same way as the consultant educational supervisors. The list of GP supervisors was obtained from the Mersey Deanery and the questionnaires for each cohort were sent at the same time as the hospital consultants (see pages 81-83 above). As will be looked in more detail in chapter ten, questionnaires were not sent to the PRHOs who worked in general practice.

Interviews were also arranged with GP educational supervisors. The interviews were conducted in the surgery of the interviewees with each interview lasting

approximately half an hour. The GPs were “recruited” in the same way as hospital consultants through volunteering when they returned the questionnaires by filling in the reply slip on the covering letter which accompanied the questionnaires (appendix C). The interviews followed the pattern of the hospital interviews. They were asked in depth for the first part of the interview about how well the PRHOs performed undertaking what is expected of them in general practice. The 2nd part of the interview looked at their views on curriculum change in Liverpool. The interviews were analysed in the same way as the supervisor interviews (see pages 94 onwards below).

Four surgeries in the Mersey Deanery region supervise PRHOs in primary care, with educational supervision split between two GPs at one practice. For each of the three years that questionnaires have been distributed for this project the two GP supervisors from one practice have taken it in turns completing the questionnaires. Both of these supervisors have been interviewed as part of this thesis. Two GPs were interviewed as part of the pilot interviews in 2001. Three took place in 2002 and two more took place in 2003. One of the interviewees who took part in the pilot study stopped supervising PRHOs in 2002 but the other interviewee who was interviewed in 2001 was interviewed again in 2002 after he had worked for a full year with the first RMC cohort.

Qualitative data analysis

The data analysis was carried out largely using the framework approach outlined by Ritchie & Spencer (1994) which also overlaps with qualitative analysis detailed by Miles & Huberman (1994). The “Framework approach” (Ritchie & Spencer 1994) to

qualitative analysis originates from applied qualitative research. In applied policy research qualitative methods are used to meet a variety of outcomes and although the questions that need to be addressed will vary from study to study, broadly they can be divided into 4 objectives: Contextual, (identifying the form and nature of what exists), diagnostic (examining the reasons for, or causes of, what exists), strategic (identifying new theories, policies, plans or actions) or evaluative (appraising the effectiveness of what exists) which ties in with the aims of this thesis. The framework approach is ideal for the work carried out in this thesis as it is particularly appropriate when used to develop, illuminate, explain or qualify statistical research.

The framework approach is often used when there is a tight timescale for data collection and when the research needs to be targeted towards answers. As the data collected was always cohort-specific there was always a tight timescale which suits the framework approach. Both the focus groups and interviews had certain topics that needed to be covered (see the questions in chapters 8 and 9) such as how well prepared they felt for the PRHO year, and topics such as communication, clinical skills, being aware of limitations and teamwork. These had to be tied to curriculum reform and the views of PRHO and their supervisors to the introduction of PBL or increasing community placements at the expense of hospital attachments. These topics had to be covered to meet the research aims of the thesis.

Ritchie & Spencer (1994) outline 5 analytical stages. The first is “familiarization” This involves re-reading and reading the notes made just after the focus groups or interviews and the full transcripts. This begins the process of shifting and sorting the data, with the aim of listing key ideas. This is recommended by most researchers

(Frankland & Moore 2001). The second stage is identifying a thematic framework. Whilst reviewing the material, the researcher records the responses to the questions decided on prior to data collection and notes any recurrent themes and issues which emerge as important to the respondents thus setting up a framework. From here the indexing categories are made. Some categories are identical to the questions, others will be emergent themes. Generally, the first version is often largely descriptive and applied to a few transcripts and as the analysis progresses it becomes more responsive to emergent and analytical themes. The thematic framework involves making judgements about the meaning of particular words in the transcripts, the relative importance of the emerging themes and confirming that the original research questions are being fully addressed.

The next stage is called “indexing” which describes the process where the thematic framework is systematically applied to the data in its textual form and provides a mechanism for labelling the data into manageable “pieces” for subsequent retrieval or exploration. The final stages of the framework approach are charting, mapping and interpretation. Once the thematic framework (or codes) has been applied to the notes and transcripts, the data is lifted from the original context and re arranged to the appropriate thematic reference in order to build up a picture of the data as a whole. Charts can be drawn from thematic framework, from the priori research questions or according to how best to present and write up the study. The text is referenced so the source can always be traced, and illustrative passages for possible quotation are referenced by transcript page numbers. Although emergent themes, patterns and association between the data have already been noted in the indexing and charting phases the interpretation of the data begins in earnest at this point. Structure is sought

after, rather than just the “multiplicity of evidence”, and the salience and “dynamics” of issues is examined, rather than just looking at patterns and associations between different parts of the data/transcriptions.

Miles & Huberman (1994) believe there are common features to analysing all qualitative data. These include noting reflections as the data is collected and affixing codes to field notes and transcripts. The materials are then “sorted and sifted” to identify similar phrases, patterns, themes, distinct differences, relationships between the variables and elaborating a small set of generalisations that cover consistencies and inconsistencies within the data. They also state that the majority of qualitative researchers will know or have a good idea about the codes, emerging themes or final conclusions from the beginning of data collection and that although conclusions may not appear until the data collection is over but they have often been prefigured from the beginning. The approach Miles & Huberman take to qualitative analysis follows a similar process to the framework approach outlined above, using different notations to describe the processes. This is in contrast to the grounded theory approach (Strauss & Corbin 1998) for example, which states that the researcher does not begin the research with pre-conceived theories in mind and allows the theory or conclusions to arise from the study.

For Miles & Huberman (1994) codes are tags and labels for assigning units to information compiled during a study and are usually applied to “chunks” of the words of various size, words phrases sentences or paragraphs and can be straightforward category labelling or could be a metaphor. Codes are used to retrieve and organise “chunks” so the researcher can quickly find, pull out and cluster the segments relating

to a particular research question, hypothesis or theme. These then set the scene for drawing conclusions. They also say you can have a provisional start list of codes prior to the fieldwork. These are derived from the conceptual framework, the list of research questions or original hypotheses. The lists of codes can then be reduced once all the data has been read through.

It is usual for other codes to emerge during analysis and these are better grounded empirically and demonstrate that the researcher is open to what the data is saying. It is also useful to code the previous set of notes before the next stage of fieldwork, and for Miles & Huberman the most rigorous qualitative research occurs when analysis is undertaken whilst the data is being collected. All transcripts and notes are subject to “data reduction” - the process of selecting, simplifying or transforming the data. Data reduction begins through the study and even before the data is collected as the researcher decides on the framework, research questions and which data collection method to use. It is not separate to the analysis it is an integral part of the analysis. Tesch (1990) sums it up as “data condensation”. The description of codes identified above is a different way of describing the thematic framework and indexing and charting described in the framework technique.

Stages of analysis for the focus groups and interviews

A basic framework of questions and topics to be discussed was drawn up prior to the focus groups and interviews taking place. These questions were slightly moderated from cohort to cohort, but were largely the same throughout the different stages of data collection. They are looked at in more detail in the chapters 8 and 9, but were

drawn up to meet the research aim of this thesis and test the hypothesis. These questions and pre-determined topics were the basis of the coding and thematic framework (see appendices F, G and H for the framework for the focus groups and interviews). The stages of the qualitative analysis are shown in table 4, pages 104.

All the interviews and focus groups were tape recorded with permission of all participants. After the focus groups and interviews notes were made by the author of this thesis. These were very brief and just alluded to anything that may not have been picked up by the tape when transcribing, particularly in the focus groups where group interactions or dynamics may have played a strong role. If any unusual points were made that stood out, then these were included in these notes.

The tape recordings were then transcribed word for word by Simon Watmough with notes being made alongside the transcriptions alluding to sections of the transcriptions which could be used alongside the framework/coding already determined by the original questions. Notes were also made whilst the transcriptions for any data which may belong to the emerging themes category.

Once the data had been transcribed it was then read through to regain familiarisation with the data as it was collected. Two coding frameworks were made; firstly the data in the transcriptions relating to the original questions was put into a thematic framework, this was expanded to include the notes taken about the emerging themes when the data was transcribed. Then any further emerging themes which were identified during the “familiarisation” process were identified. Once this had been done the framework was applied to all the transcriptions with definitive categories and

sub categories. For example “knowledge base” was originally coded or indexed as one category and it was known from the start this was a prior issue from the list of questions. However, it soon became clear there were different aspects of “knowledge base” - for example knowledge of anatomy, physiology, biochemistry, pharmacology, and the other sciences, understanding of disease processes, or concerns about knowledge base after the PRHO year.

Any part of the data of any of the transcriptions that were not in the overall coding framework or in any of these categories or sub categories were placed in a miscellaneous category. These were analysed again to make sure nothing important had been left out or that they didn't justify their own category or subcategory or place in the framework. These categories were discussed with the supervisors of this thesis to ensure a fair analysis and they were given initial drafts of the analysis to check the coding framework chosen was accurate. The transcripts were re read through just to make sure nothing had been left out and they met the coding framework. The sub-categories and categories (or indexes) were merged together and written up in the form they appear in the chapters showing the focus group and interview results.

Each set of qualitative data was analysed before to the next set. The focus groups with the traditional graduates were analysed before the groups with the first cohort of the reformed curriculum and these results were analysed before the second cohort were arranged. This meant some changes could be made to the questions (see chapter 8). The pilot interviews were analysed before the interviews which took place in 2002 which in turn were analysed before the interviews in 2003. There was a practical element to this - it meant that the data was always kept at manageable levels and the

data analysed in more depth than if it had all been done at once, and made it easier to distinguish between first and second cohort focus groups and interviews. It helped streamline the data analysis for the second cohort interviews and focus groups, and was also useful as each set of data informed the next stage of data collection (Denzin & Lincoln 1994). After the “pilot” supervisor interviews it was realised that the areas of history and examination needed to be included in the questions and that the knowledge base issue should be looked at in more detail.

There were, of course differences between the analysis of focus groups and the interviews. The questions were slightly different for the supervisors and PRHOs reflecting their different perspectives on curriculum reform and that the PRHOs were being asked about their own competencies, the supervisors to judge the PRHOs’ competencies. The focus groups inevitably took longer to analyse. As Krueger (1997) points out it is essential to take group influences into account when analysing the data. After each focus group notes were taken about how the group had interacted with each other and any specific interactions between group members or jokes made between individuals or the groups as a whole. These notes were included in the familiarisation, indexing and coding stages.

Triangulation

It has discussed briefly in the previous chapter why using mixed methods are necessary in any major research project. Rossman & Wilson (1991) suggest that using mixed methods can corroborate and confirm each research method via triangulation and this can initiate new lines of thinking. Greene *et al* (1989) say that mixed

evaluation studies can help sequentially as the data as one set of data informs the methods for another. Qualitative methods can also be used to help “explain” the quantitative results, or quantitative results can triangulate or validate the qualitative conclusions. Quantitative and qualitative can combine to “persuade” the reader. Quantitative results “persuade” the reader by de-emphasizing individual judgement leading to precise and generalizable results, qualitative persuades through rich depiction (Firestone 1987). Carney (1990) suggests if a result or conclusion appears through one method then, the same question should be asked again in another methodology and if it is valid then the same answer will appear. Many of the focus group and interview questions were similar - and overlapped with the questionnaire variables. As Miles & Huberman (1994) conclude (page 267) “...triangulation is not so much a tactic, but a way of life. If you self-consciously set out to collect and double-check findings using multiple sources then and modes of evidence the verification process will be largely built into data collection... In effect triangulation is a way of validating the data – by seeing or hearing multiple instances of information from different sources using different methods and by squaring the finding with others it needs to be squared with.”

As the data is reported in the following chapters, cross references will be made to the results in other chapters in the relevant discussion sections. Also, links will be made to the ties between the three different methods. Using three distinct methods has helped to reduce bias in data collection and give a clearer view of the impact of curriculum reform.

Table 5

Table 5 shows 4 different ways quantitative and qualitative methods can be integrated. Illustrative design linking qualitative and quantitative data (Miles & Huberman 1994).

1	Qualitative. (continuous integrated collection → of both -----→ Quantitative kinds of data)
2	Quantitative wave 1 wave 2 wave 3 Qualitative-----continuous fieldwork-----
3	Qualitative -----→ Quantitative -----→ Qualitative (exploration) (questionnaire) (deepen, test findings)
4	Quantitative -----. Qualitative-----→ Quantitative (survey) (fieldwork) (experiment)

This thesis combines a mixture of designs one and two above as qualitative and quantitative data collection overlapped but was collected on a cohort specific data.

Limitations

There are limitations to all three methodologies used and these will be examined further in the discussion sections in the relevant chapters. Although, as will be illustrated in chapters 5, 6 and 7, the questionnaire response rates were satisfactory, it certainly would have been preferable to have a higher response rate which may have given some bias in the results. Also, there was more data collected on RMC graduates than TMC graduates, for both the qualitative and quantitative methods. An inevitable part of qualitative research is the sampling aspect. Regarding recruiting for the interviews it was up to the supervisors who returned the questionnaires to decide if they wanted to give up some of their time to be interviewed. However, amongst a

homogeneous group 15 - 20 interviews can often be enough (Kvale 1996). The focus groups were each recruited in different hospitals, but how they were recruited had no influence on the results of the group. They were held at a mix of district general hospitals and teaching hospitals. The male/female balance was almost 50/50. Morgan (1997) has written that the number of focus groups needed for any research project is reached when no new information is being gathered from them. For each cohort no more than two were needed to gain a saturation of themes. The PRHOs were recruited in a way that would reduce or minimise the opportunity for bias and how each focus group was recruited is discussed in more detail in chapter 8.

Table 6 Stages of qualitative data analysis

Questions designed according to role of PRHO and expected competencies.
Questions designed about curriculum reform and content of reformed curriculum.
Focus groups/ Interviews arranged.
Focus groups/ Interviews undertaken and tape recorded.
Notes made by SW after each focus group/interview giving short overview of the atmosphere of them/key points.
Coding/themes/basic framework for the data analysed identified according the original questions and any early potential emerging themes.
Tapes transcribed word for word by SW.
Notes made alongside transcriptions whilst being transcribed for any common themes within the already identified codes/themes and any new emerging themes/or the possible emerging themes from the notes taken at the time.
All transcriptions read through to regain familiarity with the data.
A coding framework was gathered from the recurring themes and the original aims of the research.
These codes were the outlined along with categories and sub categories (see appendix ?) and were put in a framework which was put across all the transcriptions.
Any data found not be within this framework was put in a miscellaneous category.
This framework was validated by the PhD supervisors.
Transcripts were read through again to make sure nothing was left out.
Analysis written under the final themes/codes as emerged in the format they appear in the relevant chapters.
These are validated by PhD supervisors.

The chapter has looked at the rationale behind the research methods and why questionnaires, focus groups and interviews have been used on the study population. The rest of this the thesis now focuses on the results from the data collection.

Chapter 5. Consultant Questionnaire data.

This chapter will summarise the questionnaire data showing the supervisors' perceptions of competencies of the 2000, 2001 and 2002 Liverpool graduates. A discussion of these results and how they fit in with the hypothesis of this thesis is included in chapter 7.

The aims/content/distribution of the questionnaires

The aims and the content of the questionnaires have been covered in more detail in chapter 4. The questionnaires asked the consultants to judge the competencies of the Liverpool PRHOs they supervise using criteria laid out by the GMC in *The New Doctor* and a "general" question asking how well prepared the supervisors felt the graduates were for the PRHO year.

The list of educational supervisors was gathered from the Mersey Deanery for the following hospital trusts: University Hospital Aintree, Countess of Chester, North Cheshire, Royal Liverpool and Broadgreen University, Southport and Ormskirk District General Hospital, St Helens and Knowsley, Wirral Hospital, The Royal Liverpool Children's Hospital. As already covered in chapter 4 the questionnaires were distributed towards the end of the PRHO year so the supervisors would have worked with their full quota of PRHOs for the year. The letters to the supervisors were distributed by SW but were accompanied by a covering letter from the then Director of Medical Studies at The University of Liverpool Anne Garden and the Postgraduate Dean David Graham (see appendix C). The Postgraduate Dean is

ultimately responsible for training posts in the Mersey Deanery and PRHOs to educational supervisors. These people were well known to the educational supervisors and it showed that this project had senior support which was hoped would encourage participation. The questionnaires were distributed anonymously although the supervisors were given the option of putting their names on them when returning them and about 75% of supervisors did take this option.

Response rates

The response rates were 70.6% (110/157), 77.8% (125/161) 63.9% (99/155) for the 2000, 2001 and 2002 cohorts respectively. For each of the cohorts there were some returned unfilled because they didn't supervise Liverpool PRHOs that year (13, 14 and 14 for the respective cohorts). These were mostly from Leighton Hospital which had no Liverpool graduates working during the 3 years that the supervisors were surveyed for this thesis. A smaller number – 4, 6 and 4 for the 2000, 2001 and 2002 cohorts respectively returned the questionnaire uncompleted because they felt that they didn't know enough about their PRHOs to complete the questionnaire. Three supervisors refused to complete the questionnaire as it was based on competencies expected by the GMC whom they didn't recognise as being a legitimate setter of standards for the PRHO year despite the statutory position of the GMC.

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 together and labelled as “more than generally quite competent” (more than midpoint (MTM), “generally quite competent” (midpoint) and “less than generally quite competent” (less than midpoint (LTM). The ratings for the “general” question ranged from “generally well prepared” to “generally not at all well prepared” with “generally quite well prepared” as the midpoint.

Analysis

The quantitative questionnaire data was entered into an SPSS database as it appeared on the questionnaire i.e. from 1 -5 on the Likert scale. The data was then analysed, firstly using descriptive statistics i.e. the percentages entered for each of the variables per questionnaire per cohort. Once the database was complete Mann Whitney U tests were undertaken to test for statistically significant differences between cohorts (see chapter 4). Further analysis was taken using the supervisors it was possible to identify as “consistent” among the cohorts – these will be referred to later in this chapter and in chapter 7. The qualitative data was analysed according to the principles in the analysis of the focus groups and interviews (see chapters 4, 8 and 9). The respondents were specifically asked to refer any comments to knowledge, skills and attitudes and indicate which one these referred to. These comments have been summarised into whether they were “positive” or negative” about curriculum reform and the RMC graduates. A very small number of comments did not fit into in these categories and these were put into a “miscellaneous” or general comments category.

Questionnaire results

Table 7

Perceived competence ratings provided by educational supervisors of 2000 cohort

Questionnaire variable	% rating at "more than midpoint"	% rating at "midpoint"	% rating at "less than midpoint"
Being aware of limitations	52	41	7
Working in a team	51	44	5
Venepuncture	49	40	11
Developing appropriate attitudes to personal health and well being	41	43	10
General, overall how well prepared	46	42	12
Keeping accurate records	46	47	7
Arterial blood sampling	44	36	20
Basic cardiopulmonary resuscitation	41	50	9
Writing a prescription	41	50	9
Obtaining valid consent	41	40	19
Communicating effectively	41	40	20
Using informatics as a tool in medical practice	38	46	16
Calculating accurate drug dosages	38	51	11
Diagnosis, decision making and the provision of treatment including prescribing	36	43	20
Administering oxygen therapy safely	36	54	10
Recognising of the social and emotional factors in illness	35	49	16
Correctly using a nebuliser	33	48	19
Providing appropriate care for people of different cultures	32	49	19
Urinary catheterisation	32	40	28
Performing an ECG	32	48	20
Managing time effectively	26	47	27
Use of laboratory and diagnostic services	25	43	32
Control of haemorrhage	24	48	28
Understanding the relationship between primary care and social care and hospital care and primary care	24	52	25
Understanding disease processes	23	52	24
Understanding the principles of evidence based medicine	23	52	24
Coping with uncertainty	18	44	38
Suturing	17	30	53
Understanding the purpose and practice of audit, peer review and appraisal	17	47	36
Inserting a nasogastric tube	17	28	55
Being aware of legal and ethical issues.	14	58	29
Using opportunities for disease prevention and health promotion	11	53	36

All questionnaire results are rounded up/down to the nearest decimal place.

Table 8

Perceived competence ratings provided by educational supervisors of 2001 cohort

Questionnaire variable	% rating at "more than midpoint"	% rating at "midpoint"	% rating at "less than midpoint"
Using informatics as a tool in medical practice	59	28	13
Communicating effectively	59	36	5
Working in team	57	38	5
Being aware of limitations	55	39	6
General, overall how well prepared	51	40	9
Keeping accurate records	48	42	10
Developing appropriate attitudes towards personal health and well being	47	49	4
Venepuncture	45	51	4
Recognising of the social and emotional factors in illness and treatment	43	51	6
Arterial blood sampling	41	42	17
Providing appropriate care for people of different cultures	39	53	8
Basic cardiopulmonary resuscitation	40	54	6
Writing a prescription	38	50	12
Obtaining valid consent	36	50	14
Understanding the purpose and practice of audit, peer review and appraisal	37	45	21
Calculating accurate drug dosages	32	54	14
Managing time effectively	31	52	17
Performing an ECG	31	44	25
Urinary catheterisation	30	48	22
Administering oxygen therapy safely	29	58	13
Understanding evidence-based medicine	29	62	9
Correctly using a nebuliser	27	57	16
Coping with uncertainty	25	52	23
Making the best use of laboratory and other diagnostic services	25	50	25
Control of haemorrhage	24	53	24
Being aware of legal and ethical issues	23	54	24
Diagnosis, decision making and the provision of treatment including prescribing	22	44	34
Using opportunities for disease prevention and health promotion	18	59	23
Suturing	17	37	46
Inserting a nasogastric tube	16	37	47
Understanding disease processes	13	58	29

All questionnaire results are rounded up/down to the nearest decimal place.

Table 9

Perceived competence ratings provided by educational supervisors of 2002 cohort

Questionnaire variable	% rating at "more than midpoint"	% rating at "midpoint"	% rating at "less than midpoint"
Communicating effectively	70	26	4
Working in a team	67	25	6
Using informatics as a tool in medical practice	63	34	3
Venepuncture	61	33	6
General , overall how well prepared	59	38	3
Being aware of limitations	57	38	5
Keeping accurate records	53	38	9
Arterial blood sampling	50	38	12
Basic cardiopulmonary resuscitation	49	45	6
Writing a prescription	49	48	3
Recognising of the social and emotional factors in illness and treatment	45	47	7
Obtaining valid consent	44	31	25
Urinary catheterisation	43	35	22
Developing appropriate attitudes to personal health and well being	43	46	11
Providing appropriate care for people of different cultures	40	55	5
Managing time effectively	39	44	17
Performing an ECG	36	49	15
Understanding the purpose and practice of peer review and audit	35	50	15
Understanding the relationship between primary and social care and hospital care	35	55	10
Administering oxygen therapy safely	34	53	13
Understanding the principles of evidence based medicine	32	56	12
Calculating accurate drug dosages	31	58	11
Making the best use of laboratory and other diagnostic services			
Being aware of legal and ethical issues	28	56	16
Coping with uncertainty	27	52	21
Correctly using a nebuliser	26	62	12
Suturing	23	30	47
Diagnosis, decision making and the provision of treatment including prescribing	22	46	32
Using opportunities for health promotion and disease prevention	22	51	28
Control of haemorrhage	21	54	25
Inserting a nasogastric tube	18	41	41
Understanding disease processes	18	45	37

All questionnaire results are rounded up/down to the nearest decimal place.

Table 10

Table 10 shows a comparison of questionnaire percentage ratings by the supervisors for all 3 cohorts for more than midpoint (more than generally quite competent) for the first page of the questionnaire (competencies)

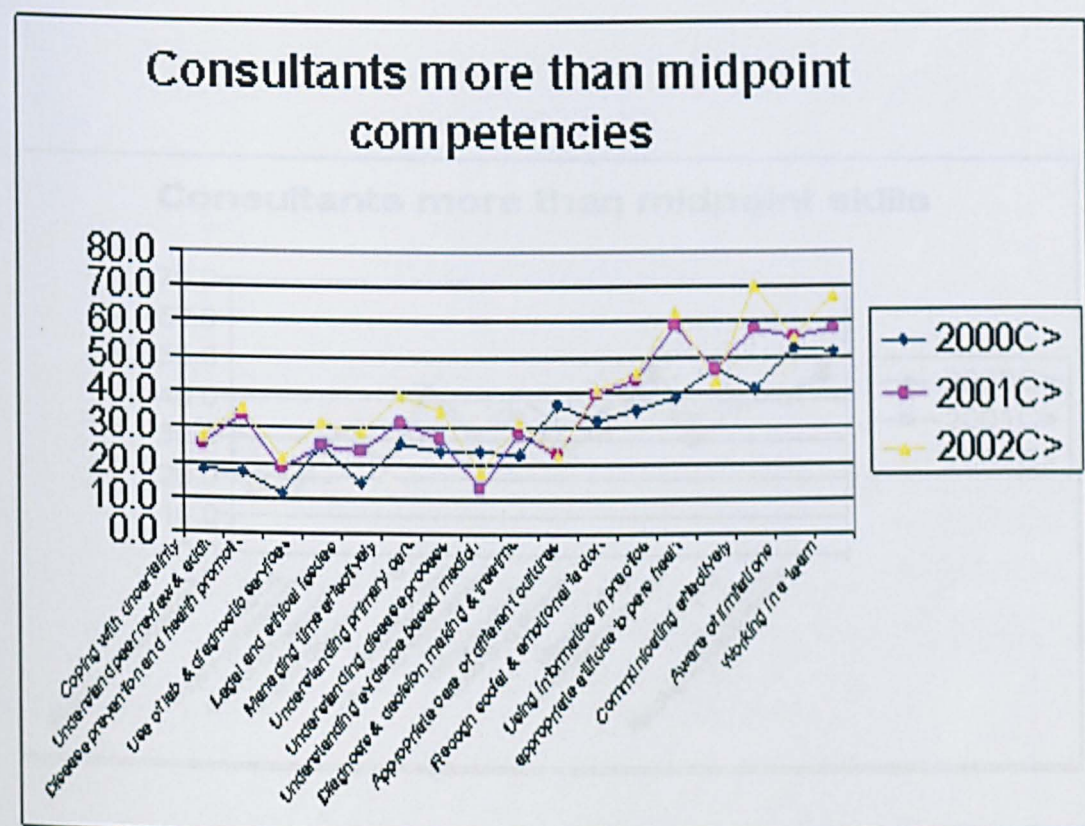


Table 11

Table 11 shows comparisons of questionnaire percentage ratings by the supervisors for all 3 cohorts for more than midpoint (more than generally quite competent) for the second page of the questionnaire (skills)

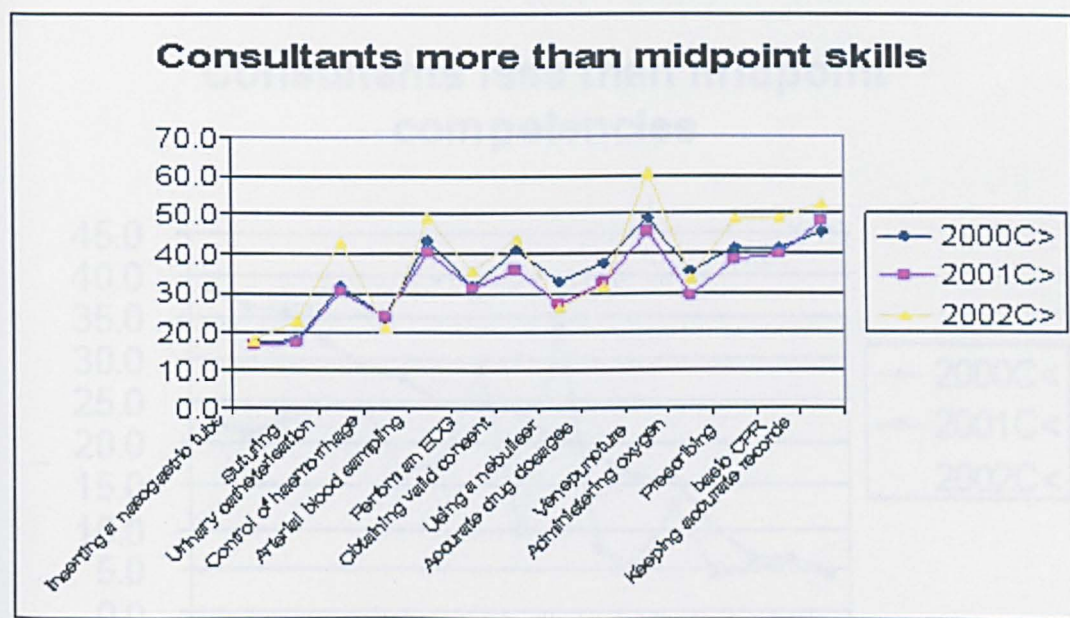


Table 12

Table 12 shows comparisons of questionnaire percentages for all 3 cohorts for less than midpoint (less than generally quite competent) for the first page of the questionnaire (competencies)

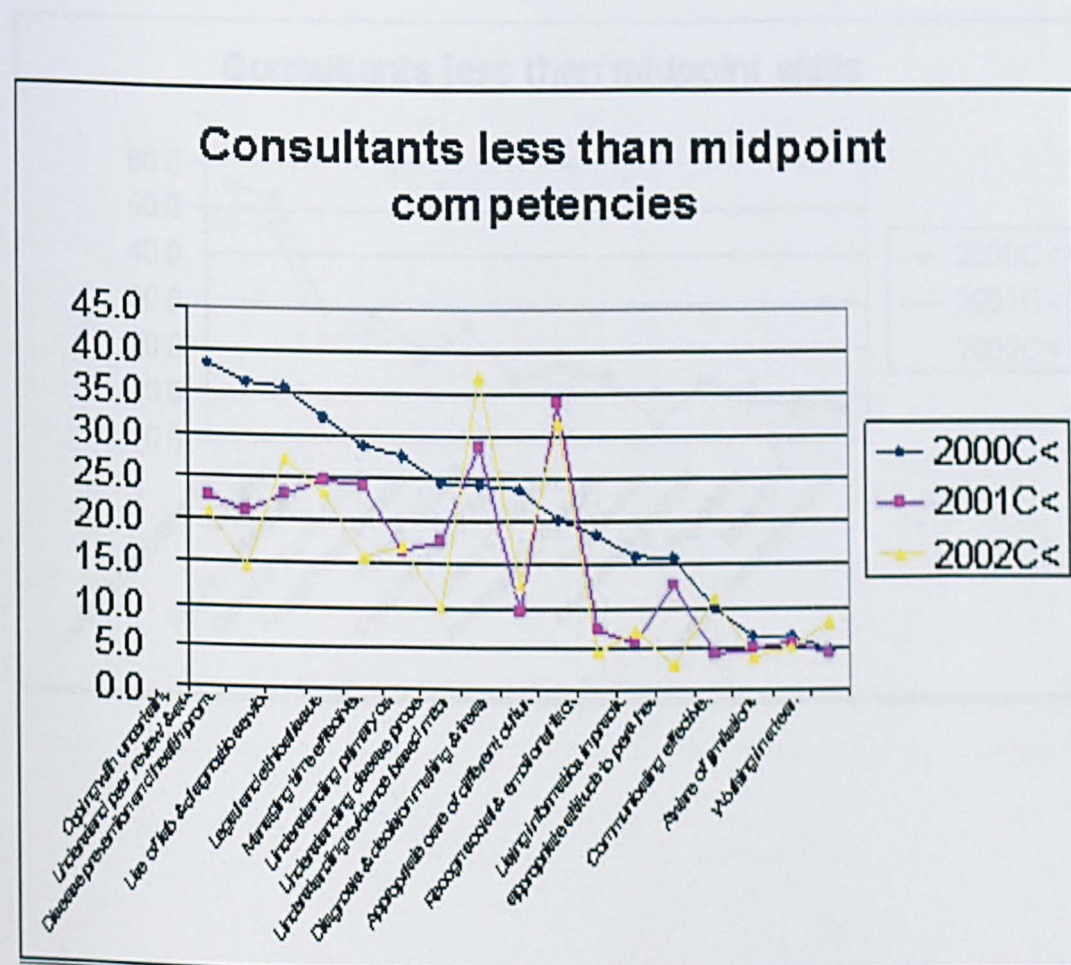


Table 13

Table 13 shows comparisons of questionnaire percentages for all 3 cohorts for less than midpoint (less than generally quite competent) for the second page of the questionnaire (skills)

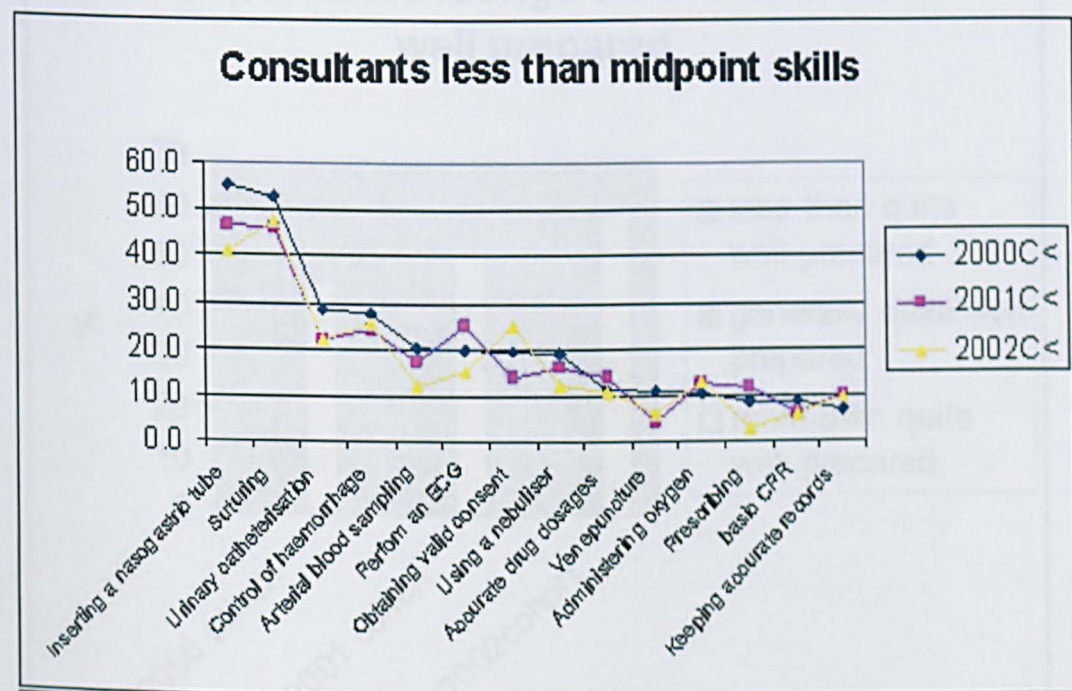


Table 14

Table 14 shows the results the results for the supervisors rating of the PRHOs for the general overall how well prepared question on the questionnaire

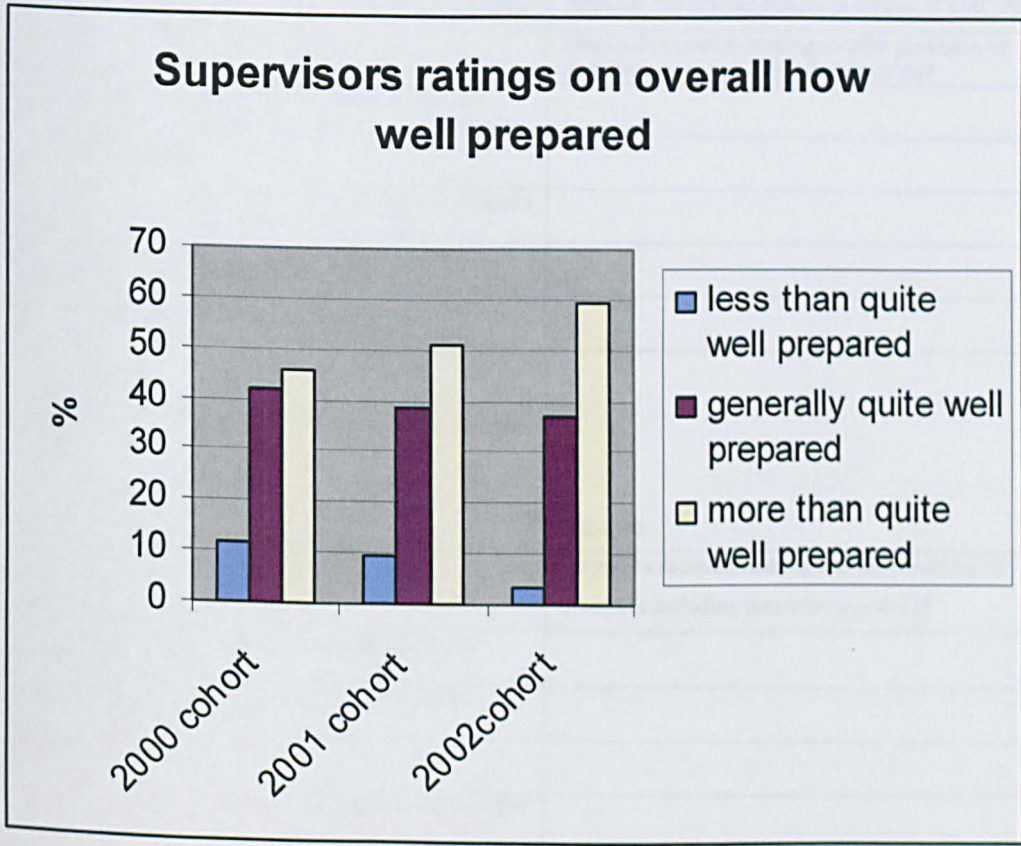


Table 15

Results of the Mann Whitney U tests between cohorts

<u>2000 & 2001 consultants, final TMC and first RMC cohort</u>	
<u>Positive (significant results in favour of RMC PRHOs)</u>	<u>Negative (significant results in favour of TMC PRHOs)</u>
Communicating effectively $p=0.005$	Diagnosis decision-making and the provision of treatment including prescribing $p=0.004$
Recognising of the social and emotional factors in illness and treatment $p=0.047$	
Coping with uncertainty $p=0.025$	
Using informatics as a tool in medical practice $p= 0.023$	
Understanding the purpose and practice of peer review and audit $p= 0.03$	
Understanding evidence based medicine $p= 0.034$	
<u>2000 & 2002 consultants, final TMC and second RMC cohort</u>	
<u>Positive</u>	<u>Negative</u>
Managing time effectively $p= 0.029$	Diagnosis decision-making and the provision of treatment including prescribing $p=0.015$
Recognising of the social and emotional factors in illness and $p=0.034$	
Providing appropriate care for people of different cultures $p=0.036$	
Coping with uncertainty $p= 0.011$	
Using informatics as a tool in medical practice $p= 0.001$	
Understanding the purpose and practice of peer review and audit $p= 0.00$	
Understanding relationship with primary and social care and hospital care $p= 0.011$	
Being aware of legal and ethical issues $p= 0.004$	
Understanding evidence based medicine $p= 0.039$	
Communicating effectively $p 0.001$	
General overall question $p= 0.03$	
<u>2001 & 2002 Consultant first two RMC cohorts</u>	
<u>Positive</u>	<u>Negative</u>
Writing a prescription $p=0.045$	None significantly

Summary of results

Overall the percentage ratings from the supervisors rise for the mid point and above when comparing the supervisors' ratings of the final TMC cohort with the two cohorts from the RMC. For example the when comparing the supervisors' ratings of the TMC cohort with the first RMC cohort 18 variables increased at MTM and 24 of the questionnaire variables decreased at LTM. When comparing the supervisors' ratings for the final TMC cohort with the 2nd RMC cohort 26 questionnaire variables rose at more than midpoint ratings and only 7 rose at less than midpoint. The supervisors rated the 2nd RMC cohort at higher than the 1st RMC cohort for 28 of the variables on the questionnaire and only 6 rose at less than midpoint. In fact the questionnaire results show that the consultants view the second cohort of the RMC as being more competent than any of the other cohorts in this thesis. Tables 8 – 11 clearly demonstrate the increases on the MTM (more than generally quite competent) and decreases on the LTM variables. Although, when comparing the two RMC cohorts only one variable has shown a statistically significant increase with “writing a prescription” ($p = <0.05$) other notable increases at MTM include; “communicating effectively” went from 57.4% to 70.4%, “working in a team” from 57.4% to 67.4%, the “general” question from 50.9% to 59.1%, and “venepuncture” from 45.4% to 60.6%.

Generally, the majority of supervisors rated the PRHOs from all cohorts at least generally quite competent for the skills on the questionnaire and this can be demonstrated when looking at the figures for less than generally quite competent or 1 and 2 on the Likert scale. For the second RMC cohort only nine questionnaire

variables received fewer than 30% on the upper two points (more than generally quite competent) compared with 13 for the first cohort of the PBL course 14 for the final RMC cohort. None of the questionnaire variables for either RMC cohort receive more than 50% for the lower two points (less than generally quite competent). Therefore the majority of supervisors rate their PRHOs as at least generally quite competent for all the items/variables.

When the results are “ranked” in order as they are in tables 7, 8 and 9 starting with the questionnaire variable which received the highest percentage score at MTM then it is clear that the RMC graduates are seen as being the most competent at “communicating effectively”, “working in a team”, “using informatics as a tool in medical practice”, “venepuncture” “being aware of limitations”, “keeping accurate records”, “arterial blood sampling”, “basic CPR”, and “recognising of the social and emotional factors in illness and treatment”. The variables which were ranked lowest overall for the 2nd RMC cohorts at MTM were “understanding disease processes” and “inserting a nasogastric tube”. The lowest ranked variables for the TMC cohort were “understanding legal and ethical issues” and “using opportunities for disease prevention and health promotion”. Similarly, seven of the “bottom 10” percentages for MTM are replicated in all three cohorts of the consultant questionnaires, “understanding disease processes”, “inserting a nasogastric tube”, “suturing”, “legal and ethical issues”, “control of haemorrhage”, “coping with uncertainty”, “using opportunities for disease prevention and health promotion.” The implication of all these results will be discussed in chapter 7.

The Mann Whitney tests reveal that 6 of the questionnaire variables showed a *significant* increase when comparing the ratings for the RMC cohort with the final TMC cohort and one variable which showed a significant decrease. When comparing their ratings for the 2nd RMC cohort with the TMC cohort 11 variables showed a significant increase compared with one variable which showed a significant decrease. These were the same 6 variables that showed a “significant” increase when comparing the final TMC ratings with the first RMC supervisor ratings (“communicating effectively” “recognising of the social and emotional factors in illness and treatment”, “coping with uncertainty”, “using informatics as a tool in medical practice”, “Understanding the purpose and practice of audit, peer review and appraisal”, understanding evidence based medicine”) and the “overall, generally how well prepared” variable, “managing time effectively”, “understanding the relationship between primary, social care and hospital care”, “understanding legal and ethical issues”, “providing appropriate care for people of different cultures”.

The one variable which showed a significant decrease when comparing the results for the TMC cohort with the 2 RMC cohorts was “diagnosis, decision making and the provision of treatment”. One variable (“writing a prescription”) showed a significant increase when comparing the ratings for the 2nd RMC cohort with the ratings for the first RMC cohort. However, overall these figures reinforce the fact the supervisors saw the RMC graduates as more competent than the TMC cohort.

The consultants also gave the second RMC cohort the highest percentages when looking at the general “overall” question of how well prepared were the PRHOs for the house officer year. They valued the 2nd RMC cohort PRHOs at 59.1% for MTM

(more than quite well prepared) with only 3.2% at LTM (the 2000 and 2001 educational supervisors rated the PRHOs at 11.7%, 9.4% for LTM respectively). Therefore over 95% of the supervisors thought the 2nd cohort had been at least quite well prepared for the PRHO year. Taken as whole, the two cohorts worth of questionnaires compare favourably with the two cohorts from the traditional curriculum.

Further Mann Whitney Tests

There were 64 supervisors who completed questionnaires for the last cohort of the traditional curriculum and the first cohort of the RMC and further Mann Whitney U tests have been carried out on this sample. This sample rates the PRHOs from the first cohort of the RMC as being significantly improved regarding; “communicating effectively” ($p=0.01$), “recognising of the social and emotional factors in illness” ($p<0.01$), “providing appropriate care for people of different cultures” ($p<0.05$), “coping with uncertainty” ($p<0.05$), “utilising informatics as a tool in medical practice” ($p<0.001$), “ understanding the purpose and practice of peer review and audit” ($p=0.01$), “understanding the relationship between with primary and social care and hospital care” ($p<0.01$), “using opportunities for health promotion and disease prevention” ($p <0.05$), “understanding evidence based medicine” ($p<0.05$). These overlap very closely with the significant improvements listed above when comparing the supervisors’ ratings from the full lists comparing their ratings of the TMC cohort with the RMC cohorts. There were no “negative” results within this subset.

Qualitative, free text responses questionnaires (Summaries)

Consultants comments on 2000 cohort, final TMC cohort

The final section of the questionnaires for the Consultants 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).*

Of the completed questionnaires 45 had comments on them. The quotations have been selected to illustrate themes from the data.

For comments relating to attitudes, there were more apparently “negative” comments than “positive” comments.

Attitudes do vary, but some do the minimum required as they have no interest in pursuing a career in my speciality. I am worried at such narrow-mindedness.

PRHOs tend to be off sick more than they used to.

There is a general “superiority” attitude and lack of humility. Patients are considered as objects rather than human beings.

Attitudes, mostly very unhappy at the prospect of independent thought or action.

Some were positive:

Excellent attitude – hard working.

Fourteen comments were made relating to skills:

It appears that their ability with practical skills is not good. They get little opportunity as students and sometimes show little willing e.g. learning to suture. However a counterweight to the various criticisms of their clinical skills, One would not expect a PRHO to have any practical skills such as suturing. This will discussed further in chapters 7, 8 and 9.

Poorly prepared for transformation from student to doctor, hopefully the new course will improve this shadowing experience.

Eighteen observations were made relating to knowledge and many were critical of the TMC knowledge base.

They have little knowledge outside their core cases and are generally unable to recognise unusual conditions as they have never heard of them e.g. carcinoid syndrome.

Their basic medical knowledge on pathology of underlying diseases is inadequate therefore understanding is not very easy.

Knowledge is patchy – good in some areas, but large “black holes”.

Some supervisors chose at this point to refer to knowledge of RMC graduates.

PBL students have bigger holes in their core knowledge!

On positive note: *In general I find Liverpool graduates more knowledgeable than those from other medical schools e.g. Bristol, Sheffield and Oxbridge.*

There are the few comments saying it was difficult to judge overall perceptions:
PRHOs varied in their abilities: Knowledge, skills and attitudes variable across PRHOs. Range from very good to worrying.

There were a couple of suggestions for improvements to undergraduate teaching.
Should have better training in management of critically ill patients as they are first "port of call" for nursing staff.

The more the students are exposed to hospital surgery and medicine the better – continuous attachments would be better, not 3-4 half days/week.

Consultant comments on 2001 cohort, first RMC

82 questionnaires had comments made on the free text section.

40 questionnaires had comments relating to knowledge.

Of these comments only 6 made comments which were complimentary about the knowledge base of the first RMC cohort.

Compared to the old style graduates, the current PRHO possesses adequate baseline knowledge for the job.

All aspects of the knowledge base came in for criticism; physiology; anatomy; pharmacology; pathology; microbiology; understanding patient management and diseases.

Knowledge of drugs and prescribing is generally poor. The only major aspect, which I feel, is worse in the new course.

Very limited knowledge in important areas, e.g. pathology, bacteriology, pharmacology. Huge gaps in knowledge.

Poor on knowledge of the body – anatomy, physiology, biochemistry.

Anatomy poor, particularly chest and limbs; deficiency in biochemistry and physiology

Some consultants did write that even though there has been a perceived decline in knowledge it hasn't affected their ability as PRHOs: *Very "well rounded", but without the in depth factual knowledge – this has not hindered them.....*

Twenty supervisors made comments on the questionnaires relating to skills. Only 50% referred directly to specific practical procedures such as venepuncture, and other

comments labelled with an “S” were more general and some were critical. For example;

I don't think their skills are any different from old style graduates. I believe it is due to a personal element rather than to the educational system.

The comments that related to practical, clinical skills were largely positive:

Clinical skills better than PRHOs from the old system.

PRHOs are much better now than in the “old days” with regard to basic practical skills when starting, e.g. handwriting, sc injections, urinary catheterisation etc.

There were 5 comments on communication skills, which were all positive.

I think they have excellent communication skills, no complaints from patients.

The communication skills are much improved now.

Nineteen comments were made relating to attitudes of the PRHOs. The vast majority of these were positive with only 8 referring to what could be termed “negative”:

The House Officers are extremely variable – but some very poorly motivated HOs are coming through, not keen to ever be accountable.

Good, but now all expect to do less and not uncommon to leave things for the next day.

Examples of the more “positive” comments:

Approach in general better than before PBL. Like to be involved in teams.

Attitudes much clearer than previous years.

I have been impressed with our last several graduates who have been willing, conscientious, competent members of the team and have been fun to work with.

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

There were a small number of comments which were not linked “K”, “S” or “A”.

The final year attachment is greatly beneficial and PRHOs are better prepared for the mundane tasks.

A small number of consultants also criticised the examination system – *the system is very poor and would only fail the most highly inept individual.*

Consultant comments on 2002 cohort, second RMC

Of the 99 returned questionnaires which were completed, 63 had comments made on the free text section.

36 of the questionnaires had comments pertaining to knowledge base. As with the 2001 cohort the majority were negative towards the basic knowledge. Only 6 comments stated that the knowledge of the PRHOs was good. *I think the knowledge of the PRHOs I supervised was good.*

Very acceptable for that of a PRHO. Will struggle in MRCP?

Other comments were much vaguer concerning the knowledge level.

Good in the areas they have studied. Gaps apparent.

The rest of the comments were generally negative.

Obvious gaps in radiology/pharmacology/dermatology

There is a perceived weakness in their general background knowledge occasionally limiting their ability in differential diagnosis, but this should improve with supervised training.

Knowledge of muscular skeletal conditions generally poor.

I have seen some glaring errors in practical, applied aspects of anatomy.

Three of the supervisors said that the knowledge of their second rotation PRHOs was always much better than their first due to the increased experience.

21 supervisors wrote comments written specifically referring to skills.

Sixteen were complimentary about the skills of the PRHOs with only five negatives.

The positives related to first and foremost practical skills, but also communication skills and their ability to work as PRHOs.

At least as good and in a number of cases better than "old curric" students.

Usually excellent communicators with patients.

Twenty consultants wrote comments about the attitudes of PRHOs.

The vast majority, 15 were very favourable about the attitudes of the PRHOs.

Generally very keen and motivated.

Attitudes are very good, more enthusiastic and willing to learn than "old curriculum"

PRHOs. More aware of social/equity issues.

..some housemen however, are and have been outstanding in their ability to cope with the work and their level of knowledge. If an individual makes such an impression then

I will specifically request a CV so that I can act as a referee in future.

Only five were not and these were largely about their attitudes to working with other members of the health care professions. But these were a minority.

Very quickly become like PRHOs from old curriculum - conflict with nurses etc.

As with the comments pertaining to the skills and attitudes these were about positive aspects of the PRHOs or the course. Many of these comments were about the "final year" shadow attachment that was seen as particularly successful in preparing students to work as PRHOs.

The final year shadowing has helped a great deal to prepare them for the shock of their first few weeks as a houseman.

Shadowing a PRHO enables a smooth transition into working life.

Again there were some criticisms of the curriculum

I am deeply concerned about the educational value of the new curriculum... I believe the University has made a mistake letting the educational pendulum swing to far.. no doubt it will come back to the middle ground in the future but meanwhile I believe you are doing your graduates a disservice.

The relevance of these questionnaire comments and how they tie in with the rest of the thesis will be discussed in chapter 7.

This chapter has displayed the results from the questionnaires sent to consultant PRHO supervisors – the following chapter will summarise the results of the questionnaires sent to PRHOs.

Chapter 6. PRHO Questionnaire Data.

This chapter will summarise the questionnaire data which was collected on the final cohort of the TMC and the first two cohorts of the TMC from the point of view of the consultant supervisors. A discussion of these results and how they fit in with the hypothesis of this thesis is in chapter 7.

The aims/content/distribution of the questionnaires

The aims and the content of the questionnaires have been covered in more detail in chapter 4. The questionnaires asked the PRHOs to assess their own skills according to the skills expected of PRHOs by the GMC laid out in *The New Doctor* (1997). There was also a “general” question asking them how well prepared they felt they had been to work as PRHOs.

Distribution methods

The list of PRHOs was gathered from the Mersey Deanery for the following hospital trusts: University Hospital Aintree, Countess of Chester, North Cheshire, Royal Liverpool and Broadgreen University, Southport and Ormskirk District General Hospital, St Helens and Knowsley, Wirral Hospital, The Royal Liverpool Children’s Hospital. The only hospital trust in the Mersey Deanery area not included was Leighton Hospital which had no Liverpool graduates working during the 3 years that the PRHOs were surveyed for this thesis. The questionnaires were distributed towards the end of the PRHO year so the PRHOs had experienced both medical and surgical

attachments. The letters to the PRHOs were distributed by SW but were accompanied by a covering letter from the then Director of Medical Studies at The University of Liverpool Anne Garden and the Postgraduate Dean David Graham (see appendix C). They knew that Anne Garden was Director of Medical Studies at The University of Liverpool and would have known when applying for PRHO posts in the Mersey Deanery that David Graham was the postgraduate dean. This showed that the project had senior support which was important to encourage the PRHOs take part in the project. The questionnaires were entirely anonymous. The details of the questionnaire distribution are included in chapter 4.

Response rates

The response rates were 67.5% (112/166) for the 2000 cohort, 57% (92/161) for the 2001 cohort, and 57% (96/162) for the 2002 cohort respectively. These response rates are only for the Liverpool graduates who were working in the Mersey Deanery for those cohorts, the very small of number of Liverpool graduates who trained as PRHOs outside the Mersey Deanery area were not contacted.

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 (MTM), “generally quite competent” (midpoint) and “less than generally quite competent” (less than midpoint (LTM)).

Analysis

The quantitative questionnaire data was entered into an SPSS database as it appeared on the questionnaire i.e. from 1 -5 on the Likert scale. The data was then analysed firstly using descriptive statistics i.e. the percentages entered for each of the variables per questionnaire per cohort. Once the database was complete Mann Whitney U tests were undertaken for statistically significant differences between the cohorts (see chapter 4 for more details). The qualitative data was analysed according to the principles in the analysis of the focus groups and interviews (see chapters 4, 8 and 9). The respondents were specifically asked to refer any comments to knowledge, skills and attitudes. These comments have been summarised into whether they were “positive” or “negative” about their skills and competencies. A very small number of comments did not fit into in these categories and were put in a “miscellaneous” category.

PRHO Questionnaire results

Table 16 Perceived competence ratings provided by PRHOs 2000 cohort

Questionnaire variable	% rating at "more than midpoint"	% "rating at midpoint"	% rating at "less than midpoint"
Venepuncture	90	9	1
Communicating effectively	89	11	
Working in a team	88	10	2
Being aware of limitations	85	14	1
Administering oxygen therapy safely	83	12	5
Urinary catheterisation	82	10	8
Basic cardiopulmonary resuscitation	80	16	4
Writing a prescription	76	23	1
Arterial blood sampling	75	19	6
Keeping accurate records	74	24	2
Diagnosis, decision making, and the provision of treatment including prescribing	71	26	3
Control of haemorrhage	66	28	6
Managing time effectively	66	26	8
Recognising of the social and emotional factors in illness and treatment	64	30	6
Correctly using a nebuliser	64	15	21
Making the best use of laboratory and other diagnostic services	63	28	9
Calculating accurate drug dosages	63	32	5
Developing appropriate attitudes towards personal health and well being	60	29	11
Obtaining valid consent	59	26	14
Inserting a nasogastric tube	59	15	25
Understanding evidence based medicine	58	31	11
Appropriate care for people of different cultures	57	30	13
Using informatics as a tool in medical practice	51	29	20
Understanding disease processes	50	42	8
Understanding the relationship between primary and social care and hospital care	49	35	16
Coping with uncertainty	49	35	16
Understanding the purpose and practice of audit, peer review and appraisal	49	31	20
Using opportunities for disease prevention and health promotion	46	35	19
Performing an ECG	39	26	35
Being aware of legal and ethical issues.	37	42	21
General, overall question of how well prepared	33	43	24
Suturing	33	30	37

All questionnaire results are rounded up/down to the nearest decimal place.

Table 17 Perceived competence ratings provided by PRHOs 2001 cohort

Questionnaire variable	% rating at "more than midpoint"	% "rating at midpoint"	% rating at "less than midpoint"
Venepuncture	97	2	1
Working in a team	95	4	1
Being aware of limitations	92	7	1
Arterial blood sampling	91	8	1
Communicating effectively	90	9	1
Basic cardiopulmonary resuscitation	88	11	1
Administering oxygen therapy safely	82	15	3
Control of haemorrhage	82	14	4
Writing a prescription	80	19	1
Urinary catheterisation	78	20	2
Recognising of the social and emotional factors in illness and treatment	76	22	2
Keeping accurate records	73	19	8
Calculating accurate drug dosages	71	24	5
Correctly using a nebuliser	70	22	8
Understanding the relationship primary and social care and hospital care	64	31	5
Developing appropriate attitudes towards personal health	63	34	3
Managing time effectively	60	34	6
Performing an ECG	60	30	10
Understanding the purpose and practice of audit, peer review and appraisal	59	33	8
Inserting a nasogastric tube	59	26	15
Understanding evidence-based medicine	58	40	2
making the best use of laboratory and other diagnostic services	56	40	4
Diagnosis, decision making and the provision of treatment including prescribing	54	38	8
Providing appropriate care for people of different cultures	53	39	8
General, overall how well prepared	53	41	6
Suturing	52	25	23
Using informatics as a tool in medical practice	46	40	14
Using opportunities for disease prevention and health promotion	46	44	10
Obtaining valid consent	46	42	12
Being aware of legal and ethical issues	41	52	7
Coping with uncertainty	33	58	9
Understanding disease processes	32	59	9

All questionnaire results are rounded up/down to the nearest decimal place.

Table 18 Perceived competence ratings provided by PRHOs 2002 cohort

Questionnaire variable	% rating at more than midpoint	% rating at midpoint	% rating at less than midpoint
Working in a team	95	4	1
Aware of limitations	90	10	
Communicating effectively	89	9	2
Venepuncture	84	14	2
Keeping accurate records	82	16	2
Basic cardiopulmonary resuscitation	80	15	5
Recognising of the social and emotional factors in illness and treatment	76	23	1
Understanding the relationship between primary and social care and hospital care	76	20	4
Writing a prescription	75	20	5
Administering oxygen therapy safely	73	35	2
Arterial blood sampling	70	19	11
Developing appropriate attitudes towards personal health and well being	69	31	
Managing time effectively	67	31	2
Calculating accurate drug dosages	67	22	11
Understanding evidence based medicine	66	28	4
Control of haemorrhage	63	31	6
Understanding the purpose and practice of peer audit, peer review and appraisal	60	32	8
Urinary catheterisation	55	32	13
Using informatics as a tool in medical practice	55	37	8
Correctly using a nebuliser	54	29	17
Using opportunities for health promotion and disease prevention	53	39	
Diagnosis, decision making and the provision of treatment including prescribing	52	32	16
Making the best use of laboratories and other diagnostic services	50	42	8
Performing an ECG	50	31	19
Obtaining valid consent	50	31	19
Providing appropriate care for people of different cultures	47	45	8
Being aware of legal and ethical issues	46	46	8
General ,over all how well prepared	45	48	7
Suturing	34	28	38
Understanding disease processes	33	50	17
Coping with uncertainty	32	49	19
Inserting a nasogastric tube	29	38	33

All questionnaire results are rounded up/down to the nearest decimal place.

Table 19

Table 19 shows comparisons of questionnaire percentages for the three cohorts of PRHOs for more than midpoint (more than generally quite competent) for the first page of the questionnaire (competencies)

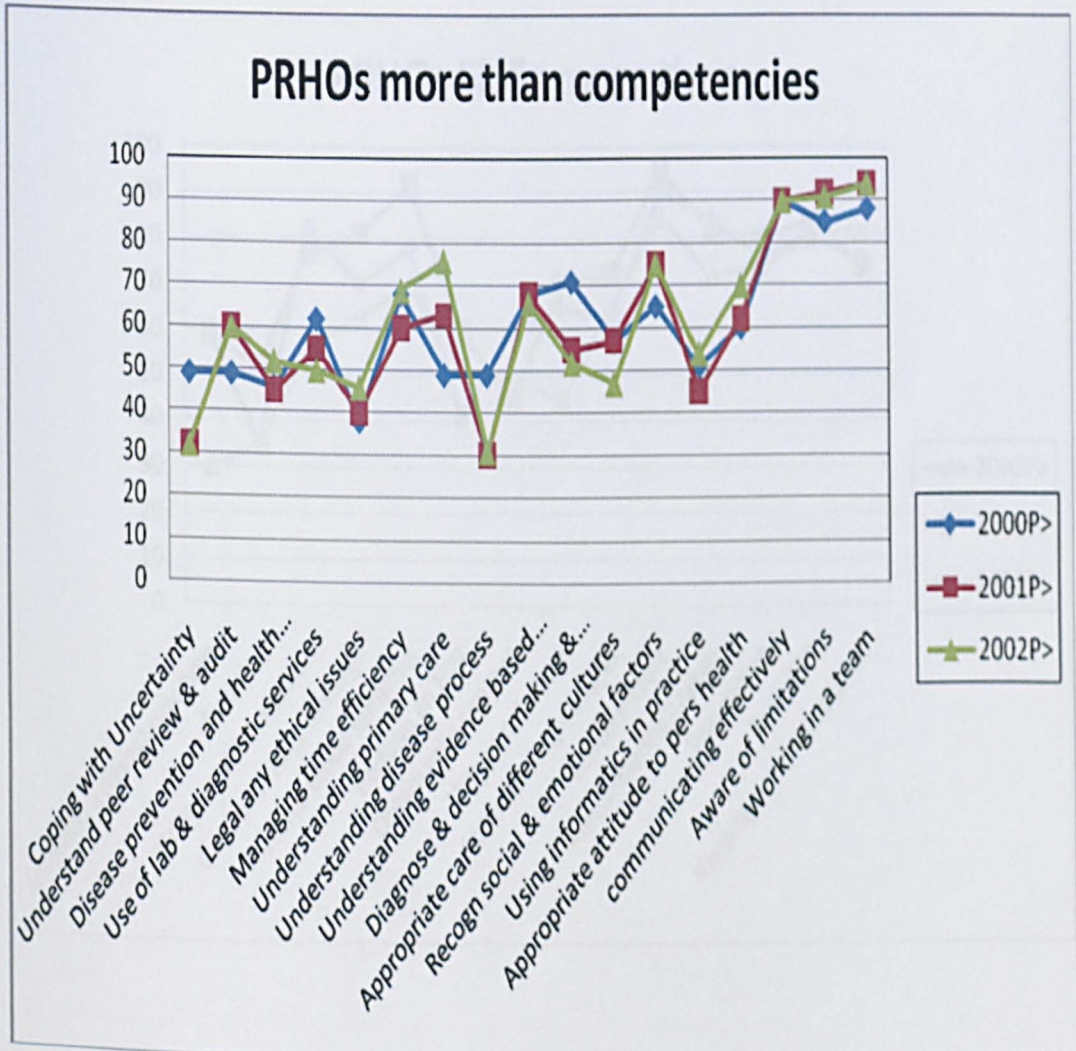


Table 20

Table 20 shows comparisons of questionnaire percentages for all 3 cohorts of PRHOs for more than midpoint (more than generally quite competent) for the second page of the questionnaire (skills)

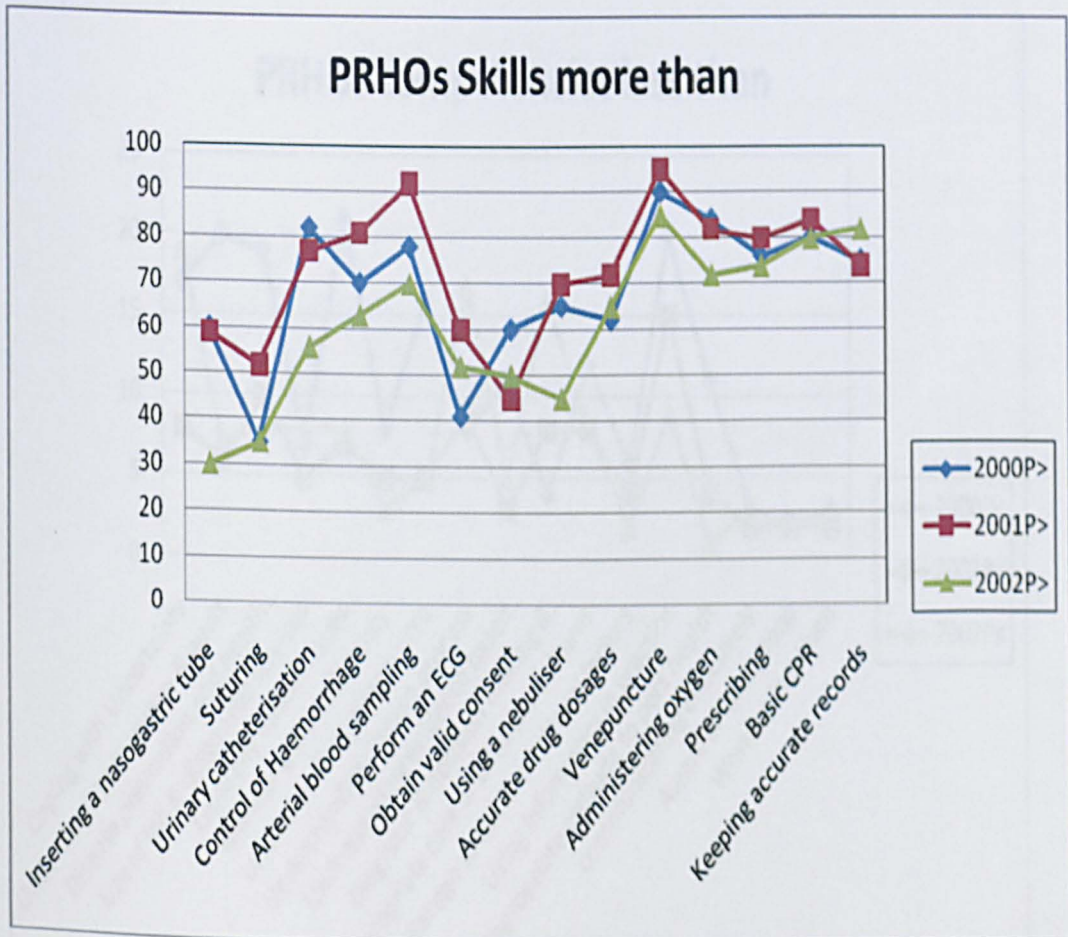


Table 21

Table 21 shows comparisons of questionnaire percentages for all 3 cohorts of PRHOs for less than midpoint (less than generally quite competent) for the first page of the questionnaire (competencies).

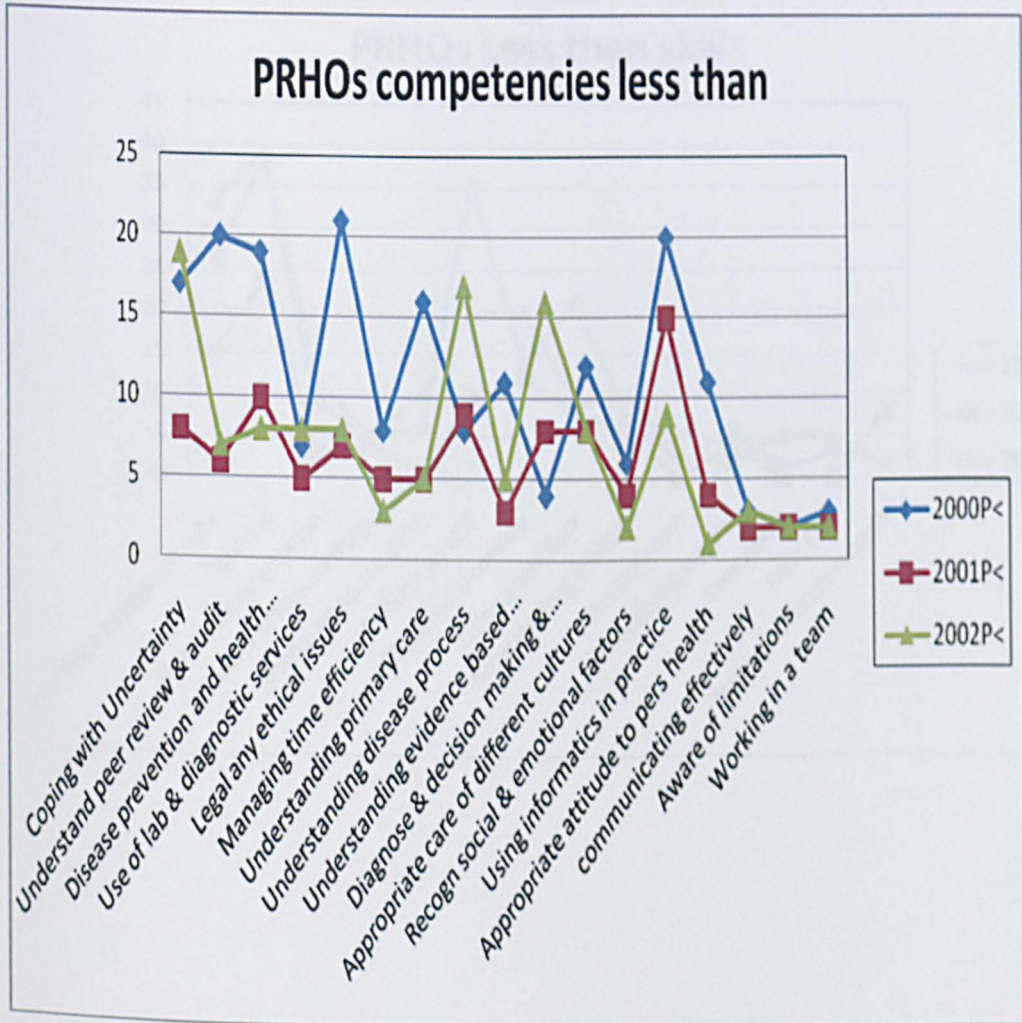


Table 22

Table 22 shows comparisons of questionnaire percentages for all 3 cohorts of PRHOs for less than midpoint (less than generally quite competent) for the second page of the questionnaire (skills)

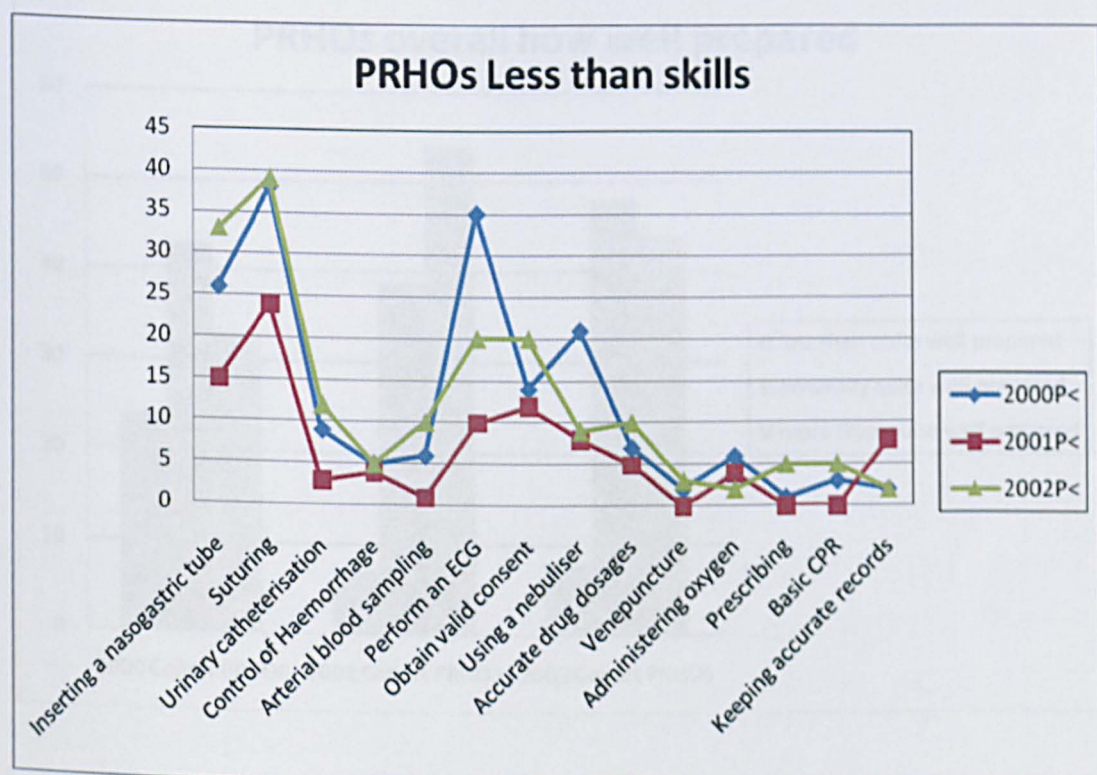


Table 23

Table 23 shows the results the results for the 3 PRHO cohorts for the overall how well prepared for the PRHO year questionnaire variable?

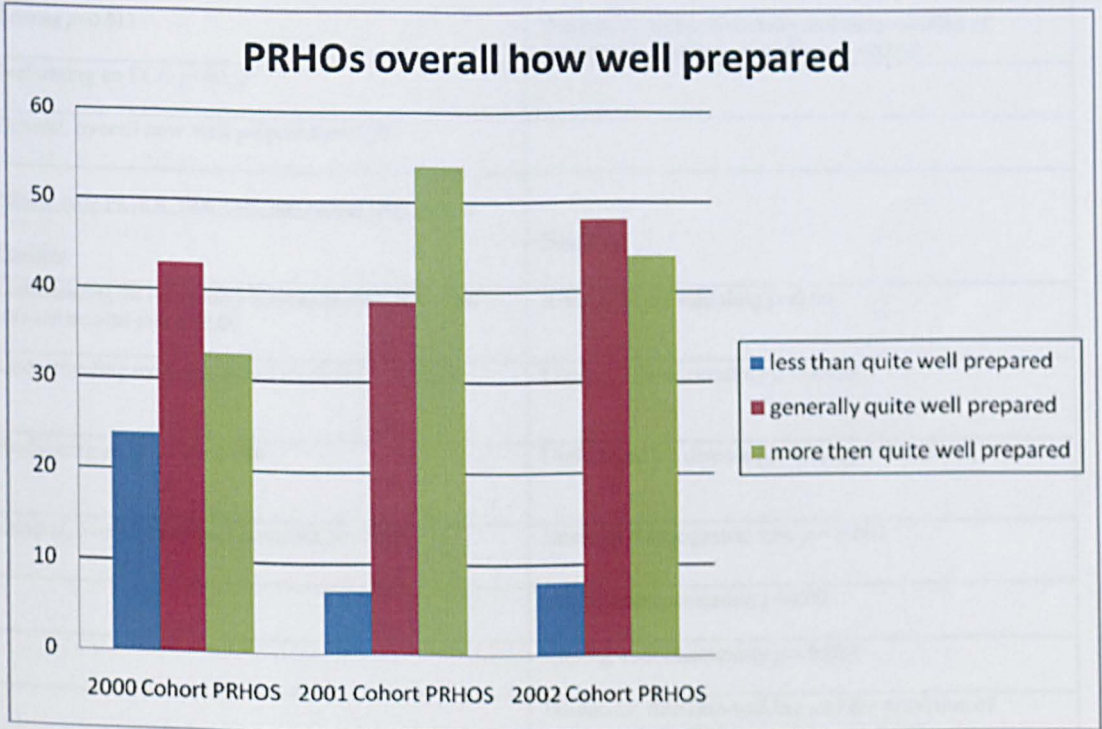


Table 24 Results of the Mann Whitney U tests between cohorts

<u>2000 & 2001 PRHOs, final TMC and first RMC cohort</u>	
<u>Positive (significant results in favour of RMC PRHOs)</u>	<u>Negative (significant results in favour of TMC PRHOs)</u>
Understanding the relationship between primary and social care and hospital care $p=0.007$	Understanding disease processes $p= 0.023$
Suturing $p=0.013$	Diagnosis, decision-making and the provision of treatment including prescribing $p =0.002$
Performing an ECG $p=0.00$	
General, overall how well prepared $p=0.001$	
<u>2000 & 2002 PRHOs, final TMC and second RMC cohort</u>	
<u>Positive</u>	<u>Negative</u>
Understanding the relationship between primary and social care and hospital care $p=0.00$	Arterial blood sampling $p=0.00$
Understanding evidence based medicine $p=0.039$	Coping with uncertainty $p= 0.028$
Performing an ECG $p= 0.046$	Understanding disease processes $p= 0.013$
General, overall how well prepared $p= 0.008$	Inserting a nasogastric tube $p= 0.001$
	Urinary catheterisation $p=0.00$
	Coping with uncertainty $p= 0.028$
	Diagnosis, decision-making and the provision of treatment including prescribing $p =0.002$
<u>2001 & 2002 PRHOs first two RMC cohorts</u>	
<u>Positive</u>	<u>Negative</u>
None	Arterial blood sampling $p=0.002$
	Urinary catheterisation $p=0.004$
	Inserting a nasogastric tube $p=0.00$
	Suturing $p=0.017$
	Correctly using a nebuliser $p=0.014$

Summary of results

The majority of the variables were rated by over 50% for midpoint or above.

Twenty three of the questionnaire variables for the 2000 cohort being were rated at over 50% for MTM, 26 variables by the 2001 cohort and 25 by the 2002 cohort.

When the results are “ranked” in order as they are in tables 16, 17 and 18 starting with the questionnaire variable which received the highest percentage score at MTM then 7 variables (“venepuncture”, “working in a team”, “being aware of limitations”, “communicating effectively”, “administering oxygen therapy safely”, “basic CPR” and “writing a prescription”) are in the “top ten” for all 3 PRHO cohorts.

“Urinary catheterisation and “keeping accurate records” were rated in the “top 10” for the 2000 and 2002 cohorts and “arterial blood sampling” was ranked in the “top ten” of both the 2000 cohort and the 2001 cohort. Of these variables, four were rated at over 90% by the 2001 cohort and two were rated at over 90% by the 2002 cohort.

There was considerable overlap between these variables and the ones ranked as highest in the supervisors and this will be looked at in chapter 7. When the results are “ranked” in order, but starting with the questionnaire variable which received the lowest percentage score at MTM only four variables “suturing”, “understanding disease processes”, “coping with uncertainty” and “understanding disease processes” were rated in the “bottom ten”. The skills at which the RMC graduates rated themselves very strongly at such as “venepuncture”, “working in a team”, “communicating effectively” and the other skills which were towards the top of the list of results, are the skills which the supervisors feel are particularly important for

PRHOS to have (cf chapter 9). The implications of all these results will be considered in chapter 7.

Another indication of overall how competent the PRHOs from all 3 cohorts felt at the skills listed on the questionnaire can also be illustrated by concentrating on the percentages at LTM. For example there were only a very small number of variables on the questionnaires for each cohort which were rated over 20% for LTM. For the 2000 cohort: “suturing” (37.1%) “being aware of legal and ethical issues” (20.4%), “performing an ECG” (35.4%), “inserting a nasogastric tube” (25.5%) and “correctly using a nebuliser” (20.8%). For the 2001 cohort none of the variables are rated at over 20% for LTM and for the 2002 cohort only “suturing” (38.3%) was above 20% at LTM. Therefore in all three cohorts of PRHOs 80% rated themselves at MTM or at least generally quite competent for the vast majority of skills and competencies on the questionnaire.

Despite the fact that the ratings overall were higher at MTM when comparing the TMC cohort with both RMC cohorts there were mixed results from the statistical significance tests. When comparing the final TMC cohort with the first RMC ratings 4 questionnaire variables; “understanding the relationship between hospital care and primary care”, “suturing”, “performing an ECG” and the “overall” question of how well prepared were rated as significantly higher in favour of the RMC cohort. “Understanding disease processes” and “diagnosis, decision making and the provision of treatment including prescribing” had significantly improved in favour of the TMC cohort. When comparing the TMC cohort with the 2nd RMC cohort “understanding the relationship between hospital care and primary care”, “understanding evidence

based medicine” “performing an ECG” and the “overall” question of how well prepared with were rated as significantly significant by the RMC PRHOs.

“Understanding disease processes”, “diagnosis, decision making and the provision of treatment including prescribing”, “coping with uncertainty”, “inserting a nasogastric tube”, “urinary catheterisation” and “arterial blood sampling” were statistically significant in favour of the TMC cohort. Five questionnaire variables; “arterial blood sampling”, “urinary catheterisation”. inserting a nasogastric tube, “suturing” and “correctly using a nebuliser” were statistically significant in favour of the 1st RMC cohort when comparing the two RMC cohorts. These results will be discussed in chapter 7.

Qualitative, free text responses questionnaires (Summaries)

The final section of the questionnaires for the PRHOs stated: 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 PRHO cohort, final TMC

Of the completed questionnaires only 30 had comments on them.

10 related to attitudes.

Attitudes: No one ever tells you what it involves until you start doing the job.

Prepared as well as you can be. Sometimes you just have to get on with it.

Nine comments were relating to knowledge.

Good preparation at Liverpool in preparation for House Job as knowledge.

My knowledge could have been better, however you definitely don't really learn until you are actually working.

Plenty of knowledge at time of qualification. However there was no guidance on how this should be narrowed down and used in certain situations....

Sixteen respondents made specific reference to clinical skills.

Need to have more clinical skills training before starting.

A great deal of time... spent on skills such as venepuncture and BP readings. Though welcome and necessary I think less time spent on these skills and more on practical skills such as LP/chest drain/tap would be more useful in the PRHO year.

Have never had to perform an ECG or insert a nasogastric tube, but I could probably do it if necessary. Am now proficient at suturing, but could not do it at start of PRHO year as A & E attachment was over 4 years ago.

Education in skills poor as skills centre only used by new course.

In terms of knowledge our course prepared us well, however in terms of the role and skills required for a PRHO we were less prepared than the new style course.

2001 PRHO cohort, first RMC.

Of the 90 questionnaires completed and returned only 20 had comments on them.

Twelve of the questionnaires had comments relating to knowledge and these were all negative.

Consultants will always expect a higher level of knowledge than a PRHO has attained, but the new course has given a reasonable background. Perhaps more emphasis on basic sciences needed.

Feel my knowledge is less comprehensive than other PRHOS. Although I gained a lot from my GP attachments you need to spend much more time there in hospitals to gain a similar level of experience in dealing with hospital problems as a PRHO.

Knowledge – felt at a disadvantage with knowledge, no formal lectures ultimately means less factual knowledge, need hours more personal reading to achieve same as one hour of teaching, disadvantage for MRCP level

Weakness in anatomy knowledge – may particularly affect those wishing to follow a surgical career.

There were only a couple of positive comments regarding knowledge.

My knowledge has been generally sufficient for the PRHO year.

Eight questionnaires had comments related to skills with only one that was not complimentary: *Not as prepared as I would like, re prescribing.*

The others were generally enthusiastic:

Skills – Wonderful. Compare Liverpool students to others on the ward and they will have much more ability in clinical skills in 95% of occasions, thank you.

My practical skills prepared me for PRHO and gave me the confidence to further my skills quickly to chest aspirations.

There were two were specified by the PRHOs as (A)on the questionnaire. One stated that attitudes of students on their curriculum was good, the other said:

However good your knowledge and skills were, there is nothing that can prepare you for the responsibility you will feel in the first week, however I felt I had the skills to deal with the responsibility.

2002 PRHO cohort, 2nd RMC.

Of the 94 PRHO questionnaires, returned only 21 had comments in the free text section.

Of these 21 questionnaires, 14 had comments relating to knowledge and all but two of these were negative.

I really noticed gaps in my knowledge during my surgery job with regards to anatomy, not to the point where I could not do my job, but it was frustrating.

Extremely poorly prepared for postgraduate exams. Minimal understanding of basic sciences, hampering higher understanding of clinical medicine.

The big weakness of the Liverpool course is the unacceptable lack of theoretical knowledge.

One comment summed up how they felt the knowledge could be improved.

Relatively insufficient knowledge base – a few more lectures would benefit greatly.

Eleven PRHOs made comments on the questionnaires relating to skills. These were generally very positive to the training they received as undergraduates.

The clinical skills have proved invaluable.

Clinical skills prepared well.

Six comments were written pertaining to attitudes and again, these were generally positive.

Developed communication skills especially dealing with the intricacies of the medical team and nursing staff.

There were also 6, more general comments made.

I was a little apprehensive about the attitudes of some consultants regarding PRHOs from the new course (mainly brought about by my experience as a medical student).

They were also 3 positive comments about the curriculum overall, and the shadowing in particular was praised. *Very useful to do the shadowing in the 5th year.*

This chapter has illustrated the results from the PRHO questionnaires, the following chapter will discuss the relevance of these results.

Chapter 7. Discussion of questionnaire results.

Chapters 5 and 6 have illustrated the questionnaire results for the three cohorts of questionnaires distributed to the supervisors and their PRHOs. This chapter will discuss the potential limitations of these questionnaires, the implications of the results, how they stand alone as independent results, and how they tie in with the qualitative research and the overall hypothesis of this PhD.

Potential limitations

It is possible that the timing of the distribution of the questionnaires may have been influential on the final statistics. All three cohorts of questionnaires for the PRIOs and their supervisors were distributed in the spring. The PRHOs were asked in the covering letter to look back to when they started working as PRIOs when judging their skills. Therefore, they were asked to look back and judge themselves the first time they carried out those tasks as PRHOs. Of course it is possible that some PRIOs may have judged their skills at the time of completing the questionnaires rather than the first time they had to undertake a particular task whenever that happened in the PRHO year. However, all three cohorts would have been subject to the same bias. Some of the PRHOs may not have undertaken some of the practical skills and may be judging themselves on how they performed as students – or how they perceived they might have performed. Again, this would be subject to the same bias between cohorts. It is possible for the PRHOs in particular that their judgement may have been clouded by the time elapsed since August when the PRHOs began their first rotation. Also, the questionnaires do not directly ask the respondents to link their own performances

(in the case of the PRHOs) or the supervisors' perceptions of performances to their undergraduate education. However, the "general" overall question asked specifically about preparedness for the PRHO year and all the questionnaires included a covering letter informing the respondents about the project.

The supervisors were asked to rate the competencies of the PRHOs when they started with them. It may be that all supervisors didn't always do this, but as with the PRHO questionnaires, as the supervisor questionnaires for each cohort were distributed at the same time during of the year they were subjected to the same bias. Some of the supervisors would have had graduates from different medical schools and on each questionnaire the supervisors were asked to state how many Liverpool PRHOs they were supervising which came before they filled in the main body of the questionnaire. This should have focused them to think about Liverpool graduates specifically rather than any PRHOs from other medical schools. Distributing the questionnaires later in the training year does mean that the supervisors will have seen their full quota of PRHOs. For the supervisors of the first RMC cohort in particular it was important that they saw as many PRHOs as possible before completing the questionnaires.

The response rates for the supervisor questionnaires can be viewed with satisfaction. The lowest response rate was 63.9% which was received for the 2nd RMC cohort which may be due to "questionnaire" fatigue due to this being the 4th year of this project. It also important to stress that from cohort to cohort there is considerable overlap in the supervisors who returned the questionnaires. For example 64 supervisors completed questionnaires rating the final TMC cohort and the first RMC cohort. Each PRHO cohort has been over the 50% mark with the highest 67.5%

coming from the final cohort of the traditional curriculum which may be because they felt they had a point to prove (cf discussion section in this chapter and discussion section in chapter 8). Other studies have shown it is extremely difficult even to reach 50% for PRHOs (Ward *et al* 1997, Simpson 2004). The response rates were higher than some published questionnaire surveys (Schmidt *et al* 2006) and higher than the average for mail surveys of this kind which are often only about 25% (Armstrong & Lusk 1987). The RMC cohorts during the focus groups complained about the number of questionnaires they have been expected to complete, both as students and PRHOs which may have been why they were both slightly lower than the TMC cohort with 56.5% and 55.5% respectively.

It may be that the consultants have been looking, albeit subconsciously, at the perceptions of dealing with PRHOs over a number of years when completing the questionnaires (Thompson *et al* 1990). During the pilot interviews which took place in 2001 the supervisors did not just relate their answers to the 2000 cohort but to the traditional graduate PRHOs they had worked with for a number of years. However, it has been shown that in assessment supervisors are more heavily influenced by recent interactions and that they use recent performance to base their ratings (Ross 1989). There is also some literature that shows the supervisor tends to rate on the basis of overall impression of a particular house officer rather than specific aspects of performance (Jones *et al* 2001, Jones *et al* 2002, Santos – Gomez *et al* 1990). Others have suggested that any possible “halo” effect (which may lead respondents to rate on an overall perception) is not likely to cause significant bias (Jones *et al* 2001) (Thompson *et al* 1990). It is worth noting that the free text comments from the

consultants summarised in chapter 5 leave no doubt they can differentiate between TMC and RMC cohorts.

Also, during the interviews the supervisors were very happy to generalise about RMC and TMC graduates. Occasionally one supervisor may say that one PRHO was particularly poor/good compared with the others but as will be looked during the supervisor interview chapter they felt they could generalise about cohorts. The supervisors in the interviews clearly demonstrated they could differentiate between different types of PRHO, traditional or reformed, Liverpool or non Liverpool graduate for example. Also, only supervisors for all 3 cohorts mentioned they would have preferred to fill in the questionnaire on a house officer by house officer basis rather than their views on the PRHOs they have worked with as a group. During the interview process it became abundantly apparent that they could and were happy to differentiate between the competencies of traditional and RMC PRHOs.

One of the undoubted strengths, though of the questionnaires is that the variables are from the GMC guidelines so the quantitative data for this thesis is on standards not set by The University but by the regulatory body for medical education in the UK.

Another strength is that the content of the questionnaires was validated by piloting the questionnaires on the penultimate cohort of the TMC and their supervisors

(Watmough *et al* 2006 a, b, c) and that they were adapted from questionnaires used by The University of Manchester (Jones *et al* 2001, Jones *et al* 2002).

Comparisons between PRHO and supervisor ratings

The PRHO questionnaire results show that the PRHOs feel much more competent than their supervisors rate them. For example 94.7% of the second RMC cohort rate themselves at MTM for “working in a team” and 79.8% for “basic CPR” whereas the equivalent supervisor percentages were 67.4% and 48.8%. Overall, as seen in chapter 6 the vast majority of PRHOs rated themselves at more than 50% for the majority of variables at more than midpoint (more than generally quite competent) . For the supervisors only five variables rated at more than 50% for more than midpoint (“informatics”, “communicating”, “working in a team”, “aware of limitations”, “general”). The highest PRHOs’ ratings for the first RMC cohort for example at generally more than quite competent were “venepuncture”, “working in a team”, and “being aware of limitations” which was rated at 96.7%, 94.4% and 92.2% respectively. In comparison the highest percentage ratings for more than midpoint from the consultants ratings of the first RMC cohort were “using informatics as a tool in medical practice”, “communicating effectively” and “working in a team” which were rated as 59.1%, 57.8%, 57.4% respectively. Conversely the lowest percentages at MTM for the first RMC PRHOs were 31.8%, 33.3% and 41.5% for “understanding disease processes”, “coping with uncertainty” and “legal and ethical issues”. For supervisors rating the first RMC the 3 lowest MTM questionnaire percentages were 13.2%, 15.5% and 17.4% for “understanding disease processes”, “inserting a nasogastric tube” and “suturing”.

On average the PRHOs for all three cohorts rate themselves at about 30% per questionnaire variable higher than their supervisors rate them. When the results are

ranked in percentage terms as they are in tables one and two the size of the differences are further illustrated by the fact that the overall question of how well prepared the PRHOs are for the PRHO year in general is high up on the consultants' list, but near the bottom on the PRHOs'. It has to be taken into consideration that consultants are rating PRHO competencies on different numbers of PRHOs and as such is their perception of how they perform a given skill or competency. In contrast the percentages generated from the PRHO questionnaires are about just one person and are rating their own competencies so there are bound to be differences in perceptions and in the questionnaire results.

As the PRHO questionnaires represent their self-perception of their skills. As such, the results 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), medical students tend to over estimate their own diagnostic skills compared with their supervisors (Mattheos *et al* 2004) and health professionals have poor self assessment (Ward *et al* 2002).

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 3 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. Others studies (Eva & Regehr 2005) have shown that health care professionals are unable, confidently, to self assess their actions and that “external” evaluations should be used as well. This is one reason why it was important to distribute questionnaires to educational supervisors. An argument could be made that the PRHOs may have felt this was a type of assessment, although as the PRHO questionnaires were anonymous this isn’t likely. However, it is also possible that the percentages do represent how competent these cohorts of PRHOs feel they are at the skills listed on the questionnaire. As will be looked later in this chapter the 1999 PRHOs who took part in the pilot study rated themselves as much less competent as the 3 cohorts that are covered in this thesis (Watmough *et al* 2006 b). Even if the PRHOs had overrated their abilities then all three cohorts were subjected to the same bias so the results are comparable. Also, in the focus groups (chapter 8) both RMC and TMC PRHOs were able to say why they felt they may have been good at undertaking a particular skill or task and relate it to their undergraduate education.

Although the PRHOs rate their competencies much higher than do the consultants, if the MTM percentages for each variable are ranked in order starting with the highest percentages at MTM from highest to lowest some similarities can be noted. For example five of the variables in the “top 10” of the consultants’ list for the first RMC cohort are in the “top 10” of first RMC PRHOs. These are; “arterial blood sampling”, “venepuncture”, “being aware of limitations”, “working in a team” and

“communicating effectively” (see tables 6 & 15). Similarly in the bottom ten from both sets of statistics are; “understanding disease processes”, “suturing”, “health promotion and disease prevention”, “diagnosis, decision making and the provision of treatment including prescribing” and “understanding legal and ethical issues” (tables 6 & 15). However, it must stressed again that particularly from the PRHO data these are the items they are “less competent” at, not, “not at all competent” as the percentages are all less than 50% for less than generally quite competent (LTM). Although, for instance it may have been preferable if there had been higher percentages for more than midpoint, certainly for “understanding disease processes” (see the following pages for a fuller discussion on this). The fact, though, that this variable received 90% for the midpoint and above for both RMC cohorts does show the vast majority of RMC PRHOs believed they were at least generally quite well prepared for this questionnaire variable.

Discussion

Looking at and comparing the rankings between different questionnaire data does, though, give an indication of what skills and attitudes the PRHOs are stronger or weaker at compared with other skills. “Ranking” the results (both PRHO and supervisors) sees the PRHOs as being particularly strong at “communicating effectively”, “working in a team”, “being aware of limitations”, “using informatics in medical practice”, “keeping accurate records”, “venepuncture” and “basic CPR”. It can be argued that all the competencies listed in this paragraph are the main tasks expected of PRHOs. 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 and as will be illustrated in chapter nine were the questionnaire variables which the supervisors felt were particularly important for PRHOs.

Perhaps the biggest surprise from the questionnaire results is that there are not more significant improvements on 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* 2005 a, b Watmough *et al* 2006 a, b, c, d, e). During the interviews the supervisors were asked which of the skills listed on the questionnaire they felt were most important for their house officers.

However, when the results from the 1999 PRHO cohort pilot study are combined with the 2000 PRHO cohort results and compared with the two RMC cohorts 15 of the questionnaire variables showed significant improvement (Watmough *et al* 2006 b, appendix I). Six of these variables related to practical, clinical skills (‘venepuncture’, ‘control’ of haemorrhage’, ‘performing an ECG’, ‘suturing’, ‘arterial blood sampling’

and ‘calculating accurate drug dosages’). There were also significant improvements in “suturing” and “performing an ECG” when comparing the final cohort of TMC PRHOs with the first RMC cohort. The RMC graduates were assessed on skills such as performing an ECG 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. Studies elsewhere conform that this type of OSCE examination can improve performances in students (Duerson & Rommel 2000). There were no formal practical skills teaching or assessment in the TMC. In the RMC the clinical exposure in the final year and in particular the 8 week A & E placement and shadow placement 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 and “shadow” prescriptions in the final year portfolio which may explain why there is evidence of improvement year by year in the supervisor ratings and a significant improvement between the supervisors ratings of the 1st and 2nd RMC cohort. Certainly the focus groups (chapter 8) showed that the RMC graduates felt much better prepared in this area because of their training in the RMC and the TMC graduates felt under prepared in this area and had to pick up their skills as they went along. It may be that for practical procedures the TMC graduates were rating some of their competencies at the time they filled in the questionnaire rather than when they started.

The qualitative comments on the questionnaires also show (as with the comments in the focus groups and interviews) that both supervisors and PRIIOs (both TMC and RMC) felt that the RMC was better at preparing students for undertaking practical

skills. Overall, there were more likely to be more comments by the supervisors on the questionnaires relating to the RMC graduates given the fact that the supervisors would have known that when they completed the final TMC cohort questionnaires that they were the last TMC cohort. Also, it was to be expected that there would be more negative comments on the RMC questionnaires (certainly about science knowledge) as it gave the supervisors a chance to vent any frustrations they may have felt about the RMC.

The comments about the attitudes of PRHOs in the supervisor questionnaires were mirrored by the supervisors' comments in the interviews. The comments about the attitudes of the RMC were largely positive. There were many more comments made by the supervisors on the questionnaires they completed than by the PRHOs. This could be down to "diligence" i.e. the PRHOs may well have felt that by completing the quantitative data they had done more than was required. Or it could be due to how the questionnaires were distributed. The PRHOs either received them in their hospital accommodation or in the postgraduate centres whereas the supervisors would have received them in their offices and as they were in work when they received them may have given more time to adding qualitative comments. Also, the PRHOs may not have been comfortable or felt it relevant to comment on their own attitudes. However, there was very little in any of the free text comments on the questionnaires which weren't mirrored in the focus groups or interviews with supervisors.

Many of the "negative" comments on the questionnaires related to basic science knowledge and arguably the closest variables to "basic science knowledge" were "diagnosis, decision making and the provision of treatment including prescribing" and

“understanding disease processes”. Both these variables were generally negative when comparing RMC questionnaire results from both the supervisors with the TMC questionnaire results.

Neither of these two variables has received particularly high percentages at more than midpoint. For example for “understanding disease processes” the more than midpoint ratings have been 23.3%, 13.3%, and 17.5% for the supervisors’ questionnaires from 2000-2002 respectively whilst the ratings for “diagnosis, decision making and the provision of treatment” have been 36.5%, 22.3% and 22.5% respectively. Similar ratings have also been seen at the University of Manchester (Jones *et al* 2002). In the interviews and focus groups whilst there was concern expressed about basic science knowledge there was little concern about diagnosing or understanding disease processes for the level needed for PRHO although a small number of supervisors did say it may have impact later in the careers of the RMC graduates but there was no unanimity about this. A small number of supervisors did have concerns about the examination skills of PRHOs and these were the ones who expressed most concern about science knowledge in the RMC graduates (cf chapter 9). The TMC graduates in their focus groups felt they had a much better science knowledge base than the RMC graduates and this may have been factor in the higher ratings that they and their supervisors gave on these variables.

The introduction of PBL into a medical curriculum can create uncertainty about knowledge, although this is often unfounded (Prince *et al* 2003, Kaufmann & Mann 1998, Mann & Kauffman 1999, Jones *et al*, 2002) which may lead to a lack of confidence in diagnosis. The interviews with the supervisors (chapter nine) and focus

groups (chapter 8) show that a number of supervisors and the majority of PRIIOs from the RMC and TMC feel that the PBL system in Liverpool does lead to uncertainty in basic science knowledge acquisition. This uncertainty could be reflected in the questionnaire results for these variables. It can be argued that both these variables have basic science understanding behind them. However, the interviews and focus groups showed that apart from a small number of consultants, the supervisors did feel that the RMC PRHOs were well prepared to work as PRIIOs. As will be discussed in those chapters there was some concern about the possible implications for postgraduate exams. The qualitative comments on the questionnaires from both the RMC PRHOs and the consultants express concern about the knowledge base of the RMC PRHOs although, as was demonstrated in the interviews, some supervisors commenting on the TMC PRHOs expressed concern about their science knowledge. The supervisors who expressed most concern about knowledge for the RMC PRHO questionnaires were also probably the 30% or so of supervisors who rated the PRHOs at less than midpoint for “understanding disease processes” for both RMC cohorts. During the interviews for this project about a third of supervisors interviewed expressed concerns about science knowledge.

It may be that this knowledge is developed through the PRIIO 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). 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 been reported that knowledge of aspects of acute care of PRHIOs and SHIOs 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). Also, there are no significant differences between other questionnaire variables which pertain to knowledge e.g. “writing a prescription” and “making appropriate use of laboratory and other diagnostic services” and “calculating accurate drug dosages”. In fact both these variables, essential factors in patient management, show improvement in favour of the RMC graduates. There was a significant increase for “understanding evidence-based” medicine when comparing the supervisor ratings from the TMC cohort to the RMC cohorts. 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.

Due to the PRHO and supervisors' 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. This issue and the changes to the curriculum since this work was undertaken will be looked in the final conclusion to this thesis. As the scores were relatively low for these variables for all the cohorts then maybe there are certain knowledge and skills which are developed post graduation despite the GMC wanting them acquired pre-graduation. Whilst it is important to discuss these variables they still received over 50% at more than midpoint on all the questionnaires and the qualitative data does show the "knowledge issue" hasn't meant a decline in the preparedness of the of PRHOs from the RMC – in fact the evidence in this thesis suggests otherwise.

As already illustrated the final TMC and the first RMC cohorts gave much higher ratings than the 2nd RMC cohort and the penultimate cohort to graduate from the TMC who took part in the pilot study (Watmough *et al* 2005 b, Watmough *et al* 2006 a, b). In fact there is also evidence from the Oxford Medical Careers Research group that the 1999 cohort to graduate from Liverpool didn't feel well prepared to work as PRHOs (Oxford 2001). Also, the focus groups illustrated that the TMC graduates seemed almost "defensive" about their curriculum and perhaps understandably felt "threatened" by the RMC. The final cohort of a curriculum and the first cohort of a new curriculum can be seen as "different" to other cohorts. A fuller discussion of this takes place in chapter 8.

The questionnaire results from the 1999 and 2002 PRHO cohorts were weaker in comparison with the 2000 and 2001 (Watmough *et al* 2005 b) cohorts which may demonstrate that the 2000 and 2001 cohorts did feel more competent than the 1999 and 2002 cohorts. However, because they were the two cohorts on the brink of curriculum reform it may have affected the way they completed their questionnaires. The 2002 cohort results were not as high as the 2001 cohort on the “more than midpoint” percentages and in fact five clinical skills; “arterial blood sampling”, “suturing”, “using a nebuliser”, “inserting a nasogastric tube” and “catheterisation”, showed negative differences, though many of the clinical skills have generally improved when comparing the RMC cohorts with the traditional cohort (see tables 19 - 22). However, the results from the 2nd RMC cohort questionnaire showed that they rated their skills as midpoint and above. The 2nd RMC cohort focus groups reiterated that they did feel very competent at carrying out those skills. In the focus groups both RMC cohorts has certain criticisms about their course but maintained that they were well prepared to work as PRHOs. However, as will be discussed in chapter 8 there was little difference between the views of the 2001 and 2002 cohorts. When comparing the 2001 with 2002 cohorts and only 5 variables showed a significant decrease compared with 28 variables which showed a significant increase when comparing the 2000 cohort with the pilot 1999 PRHO cohort (Watmough *et al* 2005 b).

The fact that RMC graduates felt well prepared to work as PRHOs can also be demonstrated by looking at the results for the “overall how well prepared” question (see tables 14 and 23). This question is important as it is the first variable on the questionnaire and is worded differently to the intended responses to the other

variables. It gave the supervisors an opportunity to say overall how well prepared they felt the Liverpool graduates were and for the PRHO to say how well prepared they were. For the supervisors the figures on “more than generally well prepared” rise from 45% for the 2000 cohort to 51% for the 2001 cohort and up to 59% for the 2nd RMC and there is a significant improvement in the general question when comparing the ratings for the 2nd RMC cohort with the TMC cohort ratings. Only 4% of supervisors rated the 2nd RMC at less than quite well prepared. For the PRHOs the RMC graduates rated themselves as significantly better on this than the TMC cohort.

The TMC cohort rated themselves at 32% for more than quite well prepared with the first and 2nd RMC cohorts rating themselves at 44% and 53% respectively. Whereas nearly a quarter of PRHOs from the final TMC cohort rated themselves at less than quite well prepared both RMC cohorts rated themselves at well under 10% only a very small minority of those who completed the questionnaires didn't feel prepared at for the PRHO year. As already noted the supervisors rated the 2nd RMC cohort on all the questionnaires variables as higher and with more of the variables showing a significant increase compared with the final TMC cohort. These are strong figures to back the hypothesis of this thesis that the RMC will produce graduates who are better prepared for the role of PRHO. These figures are echoed in the comments of both TMC and RMC graduates and supervisors when answering the opening question to the focus groups and interviews. These comments, analysed in detail in chapters 8 and 9 show why the RMC PRHOs were rated as better prepared for the role of PRHO. The “shadowing” attachment was very important, but also the SAMPS, the A & E attachments, communication and clinical skills training also gave good preparation for the PRHO year. The TMC graduates may have rated themselves as very competent on

the individual competencies on the questionnaires but their response to the overall question and in the focus groups show they didn't feel as well prepared for the role of PRHO as the RMC graduates.

It is possible to suggest that the variables which showed "significant" improvements on the supervisors' ratings of RMC graduates on the questionnaire variables compared with TMC graduates 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". Also, the interviews clearly show that the supervisors feel there was an improvement and this was linked to curriculum reform. There was no "significant" improvement in "communicating effectively" for the PRHOs. In fact the ratings for TMC and RMC PRHOs are very high for this. The focus groups have shown that Liverpool PRHOs of both curricula 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* 2006c).

The fact that 30% of the clinical placements in the reformed curriculum are spent in the community compared with only a one-off 4 week attachment in the TMC would explain the significant increase in "understanding the relationship between primary and social care and hospital care". Although some consultants and the majority of RMC PRHOs in the interviews and focus groups felt there was too now much community teaching they did both feel that the RMC graduates had a good

understanding of primary care. The GPs in their interviews and questionnaires (cf chapter 10, Watmough *et al* 2005 a) felt that the increase in community teaching had led to a better understanding of the role of primary care in RMC students. 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” from the supervisors when comparing the 2nd RMC cohort with the final TMC cohort.

The significant 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 supervisors in the interviews (cf chapter 9) believe that the RMCs are better prepared for the role of PRHO due to the shadowing. As the RMC graduates did have a better idea of their role when they started working as PRHOs then they would have a better idea of prioritising than the TMC graduates who admitted during focus groups that they often didn’t know what their exact role was when they started work as a house officer.

The improvement 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 and it is to be noted that the RMC PRHOs rated themselves significantly better on this variable. 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. The TMC graduates in their focus group and the educational supervisors said they believed the RMC PRHOs were better at TMC students at undertaking literature searches, as did the RMC graduates themselves. As illustrated above these would help with “understanding evidence based medicine” and with peer review and audit.

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. Being able to cope with uncertainty and prioritise are key skills for PRHOs and the evidence in this thesis suggests that the RMC PRHOs are better prepared for the role than TMC graduates.

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 the majority

of the variables listed above along with other aspects of the curriculum (Watmough *et al* 2006 a, b).

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 the questionnaires link the recommendations in both these documents from an undergraduate to postgraduate setting. The RMC PRHOs in this study were assessed in the final year using a portfolio and it has been suggested that this could contribute to some of the significant improvements in the competencies of PRHOs. Other projects have looked at the influence of the portfolio in Liverpool and it isn't the place of this thesis to examine the portfolio in detail. However, the focus group and interview data and the other studies (Chamberlain 2001, Brown 2005) have shown that initially at least there was some scepticism about this form of assessment. It could be it had an impact that wasn't realised because none of the students, PRHOs or supervisors were used to it when it was first introduced. It has been shown recently that portfolios are a useful assessment tool which encourages medical students to practice the skills they will require to practise as a doctor (Pitts 2007, Watmough 2006 a). Certainly, later studies (O'Brien *et al* 2006, Ryland *et al* 2007) have shown that it seen as useful by trainees in the Mersey Deanery area. Also, as will be discussed in chapter nine portfolios can aid self-directed learning in students.

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 (GMC 2005, cf final conclusion). 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. The skills in the undergraduate and postgraduate portfolios that the Liverpool students use, overlap considerably with the skills and competencies listed on the questionnaires. Using the GMC guidelines (GMC 2005) for final year medical students and F1 and F2 trainees should ease the 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 so that any questionnaire results which raised concern could potentially be improved by this alongside the recent developments in the curriculum (Watmough *et al* 2006 a). This may reduce concern over the issue of basic science knowledge and diagnosing skills – although again, it should be reiterated that the qualitative data in this thesis suggested that the examination and diagnosis skills of the RMC graduates wasn't a particular cause for concern.

Conclusion questionnaire results

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 supervisors rated the PRHOs from the RMC curriculum at this level and the RMC PRHOs rated themselves at this level and above. Also, overall the percentages are higher at more than midpoint when comparing the supervisors' ratings of the two RMC cohorts with their ratings of the TMC cohort. Given the high percentages from

the PRHOs and even if they have over estimated their own abilities, a picture emerges of PRHOs from the RMC feeling that they are generally competent on the skills expected of them by the GMC. Overall, the questionnaires show that certainly the PRHOs feel themselves to be generally competent at the skills listed in *The New Doctor* (GMC 1997).

This chapter has focused on discussing the implications and significance of the PRHO and consultant questionnaire results and how they fit into this thesis. This chapter has suggested that these questionnaire results can be put down to curriculum reform. The following chapter will begin a detailed look at qualitative data for this thesis beginning with the PRHO focus groups.

Chapter 8. PRHO Focus Groups.

This chapter will summarise the results of a total of 13 focus groups. Four were undertaken with the final cohort of the TMC (Watmough *et al* 2002, Watmough *et al* 2006c) five with the first cohort of the RMC (Watmough *et al* 2006 c, d) and four with the second cohort of the RMC. This chapter will also look at how the groups were organised and discuss the results from the focus groups as stand alone results and demonstrate how they fit into the overall hypothesis of this thesis.

Purpose

There were two aims to holding the focus groups. One was to gather their views on the content and structure of the respective curricula from PRHOs, the second aim was to ascertain how the graduates of the RMC and TMC felt prepared for the PRHO year. Four focus groups took place with the 2000 cohort in 2001, 5 with the 2001 cohort in 2002 and 4 with the 2002 cohort in 2003. They were arranged in the spring/early summer so the PRHOs would have experienced medical and surgical attachments and were therefore in a position to relate their experiences as PRHOs to their undergraduate education. In chapter three it was highlighted how focus groups can be integrated with the other research methodologies and the benefits of holding focus groups. It has also already been outlined in chapter 4 why focus groups were arranged with PRHOs and how focus groups can elicit rich data.

Arranging the focus groups

All the focus groups took place in hospitals closest to the University of Liverpool where the vast majority of Liverpool graduates work as PRHOs. Nearly all the PRHOs who work there are Liverpool graduates. Prior to the groups commencing confirmation was sought that all attending were Liverpool graduates. The focus groups for the final TMC cohort took place in May and June 2001, the focus groups with the first RMC cohort took place between April and June 2002 and the groups with the second RMC cohort took place between April and June 2003. The venues and numbers for the all 13 focus groups in this thesis are included in table 25 below.

Table 25 Details of each focus group

<u>Focus groups final TMC cohort</u>	
<u>Venue/citation of group</u>	<u>Number in group/proportion male/female</u>
Aintree Hospital Focus Group Traditional one (FGT1)	n = 9, m = 6, f = 3
Arroe Park Hospital (FGT2)	n = 4, m = 2, f = 2
Royal Liverpool University Hospital (FGT3)	n = 6, m = 3, f = 3
Whiston Hospital (FGT4)	n = 10, m = 5, f = 5
<u>Focus groups first RMC cohort</u>	
<u>Venue/citation of group</u>	<u>Number in group/proportion male/female</u>
Aintree Hospital Focus Group Reformed First Cohort (FGRFC 1)	n = 6, m = 2, f = 4
Arroe Park Hospital (FGRFC 2)	n = 9, m = 5, f = 4
Royal Liverpool University Hospital (FGRFC 3)	n = 5, m = 2, f = 3
Southport Hospital (FGRFC 4)	n = 5, m = 3, f = 2
Whiston Hospital (FGRFC 5)	n = 8, m = 2, f = 6
<u>Focus groups second RMC cohort</u>	
<u>Venue/citation of group</u>	<u>Number in group/proportion male/female</u>
Aintree Hospital Focus Group Reformed Second Cohort (FGRSC 1)	n = 6 m = 4 f = 2
Arroe Park Hospital (FGRSC 2)	n = 4 m = 2, f = 2
Royal Liverpool University Hospital (FGRSC 3)	n = 4 m = 2, f = 2
Southport Hospital	n = 7 m = 3, f = 4

As already outlined in chapter 4 the focus groups were run in the postgraduate education centres of the hospitals during protected teaching time to allow as many PRHOs as possible to attend without affecting service commitments. Each focus group lasted for approximately an hour. Everybody who took part did so voluntarily and prior to the groups commencing the nature of the research was outlined and participants were given the option to leave at that moment or any time after.

Anonymity was guaranteed to all participants and none of the PRHOs did leave the

focus groups. There was a mix of male and females in focus groups which generally reflected the population of the cohorts as a whole. Although at the time of submission females clearly outnumber males studying medicine at Liverpool, at the time of data collection it was much more even with female students only slightly outnumbering male students for the first two RMC cohorts with the final cohort being just about evenly split between genders. This emphasises the random nature of selection. Also, all the focus groups with the traditional graduates and two of the focus groups with the first cohort of the RMC the PRHOs were shared with a researcher from the Mersey Deanery (Brown 2005) working on a different research project. So, for those focus groups it was not predictable who attended as the PRHOs attending teaching sessions were split into two groups depending on where they were sat.

The five hospitals involved in providing PRHOs for the focus groups involved two large Teaching Hospitals (The Royal Liverpool University Hospital and Aintree) and three smaller District General Hospitals (DGH) (Whiston, Southport and Arrowe Park) so there was a mix of different types of PRHOs. All five hospitals are heavily involved in undergraduate teaching as well as supervising PRHOs.

Analysis and questions

The focus groups were semi-structured with the following basic questions put to all the PRHOs who took part:

Overall how well prepared for the House Officer year did they feel through their undergraduate education?

How prepared they felt to communicate?

Did they leave university with the necessary basic knowledge (i.e. biochemistry, pharmacology, physiology, anatomy) base?

Did they received the necessary practical/clinical skills training i.e. venepuncture, catheterisation etc?

Did they leave university with good learning skills?

What did they see as the specific strengths/weaknesses of the way their course was structured/improvements they would make to it?

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 (Spencer & Ritchie 1994) which allows the objectives of and themes of the research to be determined prior to data collection. These pre-determined themes were about how well prepared they were to work as PRHOs and are listed on the previous page.

All thirteen focus groups were transcribed word for word by SW. All participants at the groups were given a number by SW for the purposes of transcription and every time somebody spoke a number was put next to the line to indicate who had said it.

The transcripts were read and re read for familiarisation and then the framework was then 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 as Miles

& Huberman (1994) do, calling the process “indexing” and then “mapping” and “coding” and placing the data into “manageable chunks” and this is in effect is what Spencer & Ritchie 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 RMC graduates about practical skills were also tied in with their answers about being well prepared to work as PRHOs. The themes and codes relating to the focus groups are covered in appendix F. 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.

The TMC graduates’ views on the knowledge base of the RMC were not included in the original themes or questions but it was something that all TMC focus groups discussed so this became part of the emerging themes and had to be categorised as a new “theme” along with the pre-determined questions. Also, the TMC graduates talked about postgraduate exams in the context of the discussions about knowledge and this was included in the questions to RMC graduates. There were more questions during the focus groups to the RMC graduates than the TMC about the content of their curriculum. It wasn’t planned to ask the TMC in detail what they felt about the RMC but as their curriculum had ceased to exist by the time of the focus groups and they had supervised final year students on their “shadow” placement it was perhaps to be expected that they often found talking about the RMC more relevant.

The focus group transcripts generally yielded 12,000 – 17,000 words per transcript. To make the analysis more manageable they were analysed year by year, so the four groups from the TMC were analysed first, then the 1st RMC cohort and 2nd RMC cohort. This allowed some minor revisions of questions. For example it was realised that although the knowledge issue was covered quite comprehensively with the first cohort of the RMC there were no specific questions about history and examination and this was included for the second RMC cohort.

The codes and indexes with the framework were slightly larger than the data yielded by the supervisor interviews (see chapter 9). This was because during all stages of analysis the group dynamic was taken into account (Krueger 1997). After each focus group SW made notes on the dynamics of the group and these were referred to during this stage of analysis. This made some sections longer as it may have included input from most of the group and maybe a dissenting voice. In this case it became necessary to highlight the general view and why there was a dissenting voice to the majority. Minority views were coded in emerging themes within the framework. There were, though very few dissenting voices and all the groups were remarkably homogenous in their views. The supervisors of this thesis checked the transcriptions to cross-reference the codes and analysis of SW.

The number of focus groups ensured a saturation of themes. With a homogenous group of participants saturation of themes is reached very quickly (Morgan 1997). For each cohort this was generally reached after two focus groups with no new codes or themes were emerging. Five were arranged with the TMC cohort in case of cancellations or lack of participation and one was cancelled at short notice. As a result

5 were arranged with the RMC in case this happened again, with the rationale that it would be better to have too many focus groups than too few. Having 4 or 5 groups per cohort and using DGHs and THs also ensured there were representative samples of PRHOs. For the second RMC only four were arranged as it was certain from previous years that they would take place in those hospitals and that if one was cancelled at short notice saturation of themes could be gained from three focus groups.

Results

How well prepared do you feel for the role of PRHO by the university/how well did you feel you made the transition from student to junior doctor?

The above “general” question was used to start all the focus groups before any more specific questions were used, and the following section shows examples of replies from this opening question.

The traditional graduates felt that they had only received “satisfactory” preparation for the house officer year and that they had different clinical experiences to each other as undergraduates and varying preparation for the PRHO year. Looking closely at what they actually said it seems there was more that the curriculum could have delivered for them. They seemed to have low expectations, as well, of how well their undergraduate curriculum could prepare PRHOs.

There are certain things in uni they can never teach you, that will never prepare you for any new job really, it's just a case of picking things up as you go along. (FGT2)

One fairly typical comment was:

In terms of knowledge I think good, but in terms of practical skills not as good as it should be – every day things like what kind of forms we need to fill in for this, that or the other. Basic knowledge of anatomy, biology etc was fine. (FGT1)

The most common answer to this general question was along the lines of

Yeah, OK as much as we needed to be. (FGT2)

A regular theme was they were not prepared for the routine aspects of being a house officer.

In the medical knowledge department I would say reasonably well...as to how to function and do the job probably not very well.

Moderately, the most preparation we got was from talking to final year medical students and PRHOs. (FGT4)

In terms of clinical skills and paperwork we didn't get any, we'd just get on the ward and do it. Being a house officer was real preparation.

I wouldn't say that I had that much clinical experience when I started.

Getting to know the mundane work of a PRHO, using a computer, filling in forms.. that could have been improved.

The induction we had was very poor. (FGT3)

One group concluded that the lack of knowledge of how a ward worked was "awful". (FGT1)

I'd say medically the knowledge was very good; we could have done with a week of following house officers.

It was surprising how quickly we did pick it up considering it was our responsibility the next day to do the job, so we had a training session of over an hour and a half and the next day it was our job, no shadowing so you don't know who to ask. If there was an SHO around you would ask them, but I agree with what the others have said. If there was anything lacking it was the practical settings. The first we were having to

do, we didn't have the experience of taking blood gases, putting catheters in, that kind of clinical skill.

Sometimes I feel like a secretary I wasn't prepared for that! (FGT4)

By contrast the PRHOs from the first cohort of the RMC believed they had received good preparation.

I was very well prepared to do the ward jobs.

I think from a practical point of view we didn't struggle which I think a lot of house officers did from the old course – they didn't know what a venflon was. (FGRFC2)

I think we were quite well prepared I think all the shadowing and stuff we did in the 5th year gave us a very reasonable basis of knowing what we had to do as a house officer.

Same here, you knew you could do the job because you had shadowed it.

There wasn't any major traumas, it was OK...it was good, we just got on with it. (FGRFC1)

The 2nd RMC cohort was also unanimous that they had received good preparation for the PRHO year and gave similar answers to the 1st RMC cohort.

I think the practical bits in the 5th year meant we were well prepared, because you knew how the wards worked, you knew what was expected of you and what your job involved.

Probably better than the old course.

Practically speaking yes.

I was well prepared for first house job. (FGRSC 2)

The course has prepared us for being house officers it is probably better to be house officer now than the old course, we are more prepared to be a house officer.

(FGRSC4)

No PRHOs in any of the RMC focus groups said they were anything other than well prepared for the role of PRHO.

“Shadowing”

The majority of the PRHOs from the RMC talked about the final year “shadowing” when discussing how well prepared they were for the house officer year.

I think the shadowing was a good idea; the PRHO shadowing...generally it was very good. (FGRFC1)

It's better with the new course because at least we had the shadowing. (FCRFC4)

We knew the hospital when we did 7 weeks shadowing in the final year. (FCRSC1)

The shadowing was said by all the participants to have reached its objectives i.e. to help aid the transition to junior doctor by preparing students for the reality of the job.

The PRHOs said they learned how to fill in x-rays forms, ECG forms and other common work tasks. They also mentioned that the shadowing prepared them for the

“mundane” PRHO jobs and it was nice to know “where they were going” and

importantly as well to whom they could turn for help before they started.

It is just the knowledge of having systems in place.. it is just having the confidence of seeing someone else make decisions you will be making, your making your own mind up and just seeing, yeah you made the right decision. (FGRSC4)

The only divergence in views on the shadowing came over the length of the attachment. Some RMC PRHOs felt 4 weeks would have been sufficient, others that 7 weeks was the optimum amount of time. There was more of a consensus was that it would have been beneficial to have shadowed both medicine and surgery, either in two 4 week blocks or two 7 week attachments especially. The fundamental reason for wanting to shadow medicine and surgery was that, despite the obvious differences between surgery and medicine, they felt they could be at a disadvantage if they had shadowed surgery and then worked in surgery as their first PRHO rotation without undertaking medicine first.

... even as a surgical house officer you are essentially medical. (FGRSC3)

... medical and surgical departments are so different.. I think you might benefit more from shadowing medicine than shadowing surgery though. I mean it is difficult to tell because I am biased and want to do medicine, but on the surgical wards there is a lot less senior support... and like we said you know, chest pain, shortness of breath, they all happen quite frequently on medical wards and there is a lot of people around to help and to learn from and see what they do and copy. But that doesn't happen frequently in some surgical wards so the 1st time that could happen could be when you are a PRHO on your own. (FGRFC1)

Other PRHOs pointed out that if their final year SAMPs and shadow placement were all in either medicine or surgery they could be at disadvantage when starting work as PRHOs.

I could have gone through my final year without having done any medicine since the beginning of the 4th year, and then I would be a house officer in surgery.. I actually realised that was going to happen so I chose a medical SAMP, but I could not have chose a medical SAMP. (FGRSC1)

Many participants did admit to some nerves when starting their first house job, particularly over being on call, but generally the shadowing had achieved its goal, according to the first two cohorts of the RMC.

When discussing the final year RMC, PRHOs also discussed their SAMPs in relation to preparedness to do the job. The SAMPs were seen as potentially very useful in terms of gaining experience relevant to becoming PRHOs but they were of a varied standard. The shadowing and final year A & E placements (cf the discussion section of this chapter) were recognised as beneficial, regardless of who had supervised them. However, the SAMPs were seen as being dependent on the supervisor.

Well it depends on the specialty, paediatrics was one of mine and just some of the practical things and just some of the ways you did ICU so it was a good way learning to present a critically ill person. (FGRFC5)

I think the shadowing and A & E were the most practical placements to do and then I think the SAMPs really depended on where you did your SAMP, who you did it with, who you ended up with and what subject you did... you couldn't always guarantee to

get the one you wanted could you? So they are not the same – they could be useless or they could be really interesting. (FGRSC3)

Views on “shadowing” by the TMC PRHOs.

The TMC graduates didn't have a shadow attachment in their course, but they were the first cohort to be “shadowed” by undergraduates in Liverpool. They felt this was an important issue and it was the TMC PRHOs who broached the subject without being specifically asked about it. They felt it definitely assists preparation for the house officer year and they would have benefitted from the shadowing. Significantly, the TMC graduates didn't mention any attachments that were particularly useful in preparing them for the role of PRHO from their undergraduate despite long attachments in both medicine and surgery in the final year of their course.

They felt that 7 weeks was too long, though, and as the people who were being “shadowed” would have liked the attachment to have been shorter.

We were tripping over each other after 2 weeks.

When I had a student this year, in the beginning it was brilliant, but then I came to a point where I had taught her everything she needs to know on a day to day basis... You can do it in a couple of weeks. (TFG4)

One group said about the 5th years shadowing

They can be a pain in the neck to deal with.

They follow us around sometimes they just get on our nerves. (TFG1)

This, of course, may be why they felt the shadowing was too long, as they experienced the responsibility of looking after students without the benefits of the experience.

The majority said that around 2 weeks would be ideal. Many of them had only had half-day shadowing/ hospital induction the day before they started their first posts and this didn't offer the necessary preparation of what the role entailed.

I didn't have anyone shadowing until I moved jobs and my (shadowing) medical student actually knew more about the job than I did.. I had been working for 7 months and he had been there for 5 weeks... and he knew things like who to phone and he would say, "you do that" and I didn't have a clue. (FGT2)

Our shadowing was basically lectures, we shadowed for about 5 hours in that week...we shadowed on the afternoon when most of the jobs were in the morning, so the good stuff - the bread and butter stuff, we didn't actually see it done. (FGT2)

As already illustrated above the "bread and butter" jobs of a house officer came as something of a shock when they began working as PRIIOs and they all felt more shadowing would have helped in this respect.

The university didn't prepare us for the menial jobs of being a House Officer, but they are doing so now with the shadowing. (FGT4)

Knowledge base

The TMC graduates felt they had good preparation regarding knowledge base and they often mentioned this when answering the opening question of how well prepared they had been for the PRHO year. Whilst the TMC graduates felt their knowledge was good, they felt the RMC PRHOs would struggle as their science knowledge wasn't up to their standard. The TMC graduates pointed out they had the necessary knowledge base overall regarding the clinical sciences; anatomy; physiology; pharmacology and pathology.

The knowledge we went in with really helped us.

We all had the basic knowledge which enabled us to cope when we started

We all started our job crammed with knowledge... (FGT1)

Our basic knowledge of anatomy, biology etc was fine..... and that includes understanding diseases and diagnosing...

We had a good foundation of knowledge – the course set us up with a good standard of knowledge. (FGT4)

One PRHO cited as an example an incident where his “background” knowledge had stood him in good stead when he came across a case he hadn't seen before. None of the graduates had any complaints or gave any examples of basic knowledge deficiency as a result of their undergraduate education. Although TMC PRHOs felt their science teaching had helped them as PRHOs, they did feel it was often badly taught and some of it was irrelevant and there were too many lectures in some of the

subjects, most notably biochemistry. This will be looked at again in the conclusion to this chapter.

The majority of the PRHOs from the RMC of both cohorts felt they had a poor basic knowledge base compared with graduates from the TMC.

I know my knowledge is the weakest, whenever I have a RITA it is always the bit where I get 2 or 3 and everything else 3 or 4. (FGRFC2)

I find it embarrassing, when you are in theatre you are dreading the anatomy questions because you know you are going to say I don't know (FGRFC1)

..it is like when they start saying there is a nerve that comes up there isn't there? I just go I haven't got a flipping clue...(FGRFC3)

Compared to the old course it (science knowledge) is rubbish.

People ask us questions and they are like did you not learn this in biochemistry and we are like, no we didn't have any biochemistry.

I am doing surgery next year so I am going to have to learn anatomy and I haven't learned any so far. (FGRSC2)

It is interesting, though, that any knowledge deficit they felt they had has not affected their ability to perform as house officers, though as one group concluded about working as a house officer relating to knowledge.

You can get by.... with the minimal. (FGRSC3)

There was also some concern the RMC graduates may have to work harder for their professional exams than traditional graduates despite their good preparation for working as a PRHO. Both RMC cohorts expressed concerns about sitting their Royal College exams, feeling that any potential holes in their knowledge would surface then. Some groups were more worried than others about this. However they did feel they would pass their postgraduate exams, but they would have to work harder than TMC graduates and make more sacrifices on their time to do so. Some felt it would take perhaps a year or so longer than traditional course graduates whereas others were not so sure, there was no real unanimity about how hard it will be for them to do so. Some TMC PRHOs believed that the RMC was preparing them for the PRHO role, the TMC in contrast was geared towards creating consultants because of the perceived extra science teaching in the TMC. Some of the RMC graduates echoed this view by saying that the TMC undergraduate exams are more like postgraduate exams and the postgraduate examination and assessment procedure didn't reflect the way they had been educated.

The first part of the Royal College of Physicians exam is basically the first and second MD type thing...in the old course they had the biochemistry and physiology we hadn't done. And for part 1 for the surgical exam is a lot of anatomy, which again we haven't done. It is easier to refresh your memory over something you have learned once and have forgotten than it is to go round and learn it again. (FGRFC5)

The MRCP is set up for the old course, but the paper based 12 modules and CDROM and you know, it all has to be spoon-fed, it is still you know designed for old intakes – that hasn't changed and so we are probably at a disadvantage. (FGRSC4)

However, although the RMC PRHOs felt that graduates from the traditional curriculum may not have remembered everything they were taught, and many did say that they wouldn't remember all their lectures, they may find it easier to revise for postgraduate exams.

So whereas in the old course they are probably revising that stuff we are actually going to be learning it for the first time. (FGRSC2)

None of the TMC graduates in their focus groups expressed concerns about taking their postgraduate exams so it must be assumed they felt they wouldn't encounter any difficulties when it came to taking those exams. However, they did express worries about the RMC students.

They spend so much time doing public health and history of medicine... yet all the postgraduate exams, they are still linked to the old course.

Yes that's right.

Our exams, multiple choice and stuff are just like the postgraduate exams. (FGT3)

A number of RMC PRHOS felt that the reason they would struggle was not because they had a total lack of knowledge per se, but because they had a different kind of knowledge base compared with TMC graduates.

The house officers last year when you had been on the ward with them on a ward round and they would be questioned; they would start on the students, then they would go on to the next and so on and so forth.... and if I answered the question you wouldn't know what the senior would say and if I didn't know it then the house officer

might know, and if he didn't know I might know, everyone knows different things...(FGRFC2)

I think we know different things to the last years that went through.. If you are going to compare it, say knowledge for knowledge then yes we do, but if this whole new way of thinking is going to go right the way from us up to when we become consultants and we still have the concepts that we don't need to know everything.....Then I think it will work. (FGRFC5)

Some PRHOs, although these were in a minority felt that knowledge base was always weak in junior doctors.

I am sure there is not much difference to how it was years ago. (because) I remember speaking to older doctors who didn't know anything when they started. (FGSC3)

It is also worth pointing out that all of the RMC PRHOs were told by some of their undergraduate supervisors on clinical placements (and they heard similar views from TMC PRHOs and junior doctors on the shadowing attachment) that the RMC course would not lead to a sufficient knowledge base. Whether that has affected their answers illustrated above must be at this point be purely a matter of conjecture, although the suspicion must be that it has played some kind of role in their answers. This will be looked at again in the conclusion to this chapter and the overall conclusion. Overall they blamed this lack of basic science knowledge on a lack of "structure" or "clear direction" in the PBL sessions in the first year in particular.

Interestingly, two of the groups with the first cohort of the RMC said that due to the lack of “structure” in the course students gained in-depth knowledge of the areas that interested them, but paid less attention to other areas.

I liked pathology and anatomy, so my biochemistry, physiology and pharmacology is appalling and other people will be better at physiology and pharmacology. It depends on what you were interested in as to what you did.

One of my friends went in there (HARC) every other day, loved it and I just did the bare minimum. (FGRFC4)

Anatomy was seen as being the weakest science by the RMC graduates. The perceived lack of anatomical knowledge was because not all the HARC sessions were compulsory and the teaching was perceived as not as structured as in the Clinical Skills Resource Centre. This perceived lack of structure or timetabling will be covered in more detail later in the chapter.

Despite feeling that they have an inadequate knowledge base none of the PRIOs felt it had affected their ability to undertake the job of PRIO. No participant gave an example of when something had been beyond their abilities, although some PRIO said that they didn’t always understand all the reasons behind their clinical decisions.

I think what we are good at is, is you know you come to work and you see a specific case you know exactly what to do, who to contact and what the test results mean, but you don’t always have the knowledge behind it.

To all practical intents we know if someone has this, you give them this, but we don’t always understand the basis behind it.

Most of us can keep people alive until someone who knows what they are doing comes along (laughs all round). (FGRSC4)

There was the recognition from a number of the PRHOs though that you can learn a lot of science knowledge during the PRHO year.

You learn more on the job than you ever learned at medical school. (FGRFC4)

Communication Skills

The TMC cohort felt they had the required skills in this area. Although they had very little formal communication training there was a kind of “you can either communicate or you can’t” attitude and that further communication skills training wouldn’t really have been necessary. There was a lot of scepticism about how valuable communication skills classes are at undergraduate level and that many doctors naturally have these skills anyway. There was also the view that the communication skills classes in the RMC take place at the expense of what they would see as more useful tuition in the basic sciences.

As a student you don’t get the opportunity to do it...you can watch other people. (FGT2)

You only really need an hour on it, not loads and loads of role-play.

I’m sorry, but if you get to the final year or PRHO year and you can’t break bad news, then you shouldn’t be a doctor. There would be something wrong wouldn’t there? (FGT3)

They believed it would be difficult to teach communication skills and that they could replicate or prepare them for a real life situation.

Nothing can prepare you for breaking bad news to patients. (FGT4)

They felt that they picked up their communication skills just by attending clinical placements.

The new course do more, but at the end of the day you either can or you can't communicate well with patients.

You are either one of those people who are good at it naturally or who will learn in time.

It is just natural ability or it is personality. (FGT1)

It comes with time

(communication) is something we can't send them to do as students.

The teaching sessions for them aren't that great

I think with communication skills you just end up with people telling stories, this happened to me, it's a nice in a way if you find a difficult situation, nice to chat about it but you don't need a group meeting to do that. You can speak to your team, again I think it is something you have to learn by doing. (FGT4)

Both cohorts of RMC PRHOs, like the TMC PRHOs, felt they were good communicators and hadn't encountered any problems in the PRIIO year.

I think we have been well prepared for breaking bad news and our comms skills in general. (FGRFC5)

Comparing ourselves to say, the 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. (FGRSC1)

Unlike the TMC PRHOs the RMC graduates criticised the communication ability of their consultants.

Sometimes you think that they are doing it badly and you think, God, that was a bit tactless, why did you say that?(FGRFC4)

The majority of PRHOs had found themselves in a position where they had given bad news and they had been able to handle this and deal with aggressive patients. RMC students have a 4 week attachment in palliative care in the 4th year and this was particularly praised for learning sensitive communication techniques.

There was a feeling though that there were too many communication skills classes, particularly in the early years at the expense of other subjects.

We had it every week didn't we....we would have been better off learning some real medicine (laughs)!

We think they could be condensed.

You just feel like, oh we are doing this again, taking one step forward and one step back and making progress and it has helped you overall but you just feel there is an awful lot of time wasted.

Each session was very long, one topic in 3 hours and it is a topic you have covered before. (FGRFC3)

The PRHOs also criticised some of the role playing involved in the teaching.

At some points it wasn't testing your communication skills, it was testing your ability to act.

It was, wasn't it? Some of it was so artificial. (FGRSC2)

The contradiction though is that despite feeling there were too many classes they used the "structures" and techniques they had remembered from those classes.

A lot of us didn't like it at the time and some of the things were seen as daft but it definitely does help, you know, further down.

It might give you a little structure, I mean I remember in my first house bit thinking oh they taught us this, this and this...before I went in there made me happier that I knew what I was aiming to say..

I must say I hated the communication skills training the whole way through the course and thought they were an absolute bind. But then when it came down to having to break bad news I actually thought, oh I know a bit about this. (FGRSC3)

And as one PRHO concluded:

I don't think they are ever going to be the most exciting classes you could have, but I think everybody appreciates what you got from them. (FGRFC3)

Clinical/Practical Skills

There were differences in the perceived ability of the TMC and RMC graduates to carry out the basic clinical/practical skills such as venepuncture, arterial blood sampling and urinary catheterisation, as listed on the second pages of the

questionnaire (see chapters 5, 6 and 7) which are the practical skills the GMC expects graduates to be able to perform.

The traditional graduates didn't feel well prepared for these skills and many of them had to learn these skills as PRHOs.

..but in our course you could clearly go through medical school without doing that kind of thing.

it would have been nice to have done a few blood gases and things rather than having to pick it up on our first day.

In another group about half the PRHOs seemed had done blood gases as undergraduates, again illustrating the varied teaching each of the house officers experienced at university. The overwhelming feeling relating to clinical skills was there were no definitive skills that all of them were taught as undergraduates. Some PRHOs had been taught some skills on clinical attachments, other PRHOs had received no tuition in any of the skills as undergraduates. The only PRHO who had actually been taught to suture said that the skills they picked depended upon which hospital or which firm they were attached to as undergraduates adding,

It was a bit of a lottery what skills you got.

Yes we had done them a few times, blood gases, things like that, it was luck more than anything really. (FGT2)

Some PRHOs talked about the "sheer terror" of having to undertake those skills as junior doctors for the first time.

Others were more philosophical:

I think a lot of those things we should have asked about and should have seen on the wards and as fifth years we should have asked to do and see those things. There are things you can always pick up on the job. Things that I picked up on the job. (FGT4)

There was a feeling amongst the TMC graduates that they could have had more exposure to the Clinical Skills Resource Centre and there was some resentment aimed at the University for that.

They wouldn't let us use the clinical skills lab.

We weren't allowed to.

Even when it was used by people on the new course and the place was empty most of the week they wouldn't let us use it.... (FGT4)

Many felt that the RMC students had benefited from their training in the centre. One group simply concluded

It gives them confidence. (FGT2)

Both cohorts of RMC PRHOs felt they had received excellent preparation to carry out practical skills and in fact they felt this was their strength as PRIIOs. None of the PRHOs expressed the view that they had encountered any problems with these skills and they were very happy with their undergraduate education in this area. Many of the RMC PRHOs actually had more experience of some of the skills such as inserting a nasogastric tube, performing an ECG or suturing than they had as PRIIOs.

I think if you compare it to someone who came from outside, I think it is one of the main strengths of the course and we have actually been prepared.

Our teaching was excellent, definitely one of the strong points (the rest of the group agree), it has carried us through the year hasn't it? (FGRF3)

Our clinical skills I think we were prepared for.

I don't think we needed any more on that.

I always thought they were taught really well. (FGRC2)

Some even felt confident enough to attempt skills they hadn't performed before.

Many PRHOs told of how they had undertaken lumbar puncture and a wide range of skills practiced in the skills lab such as colcoscopy and inserting nasogastric tubes which their consultants were surprised they could undertake.

I had to do a bladder wash out, because the nurse couldn't do it and I had never seen it done before so I was told how to do it and just did it. (FGRSC4)

When discussing their clinical skills the RMC graduates tied in their answers with the Clinical Skills Resource Centre, their shadowing attachment and the Accident & Emergency (A & E) placement. They felt the Resource Centre gave them a good grounding in the early years of the course with the mechanics of how to undertake procedures and the routines and hygiene involved in handling patients. They then practiced these skills in attachments such as the "shadowing" and the final year A & E attachment.

I think the most valuable placement for these kind of things is the A & E without a doubt....you will just have to suture, you will have to catheterise ... gases...

.venflon...you couldn't just be around and not do it. I think we were well prepared.

(FCRFC3)

I think we were much better prepared from the course actually in the final year, just from being in A & E and just having to get stuck in at the deep end and cool everyone's veins down. (FGRFC1)

A & E was very good.

I did it first and really loved it, I was enthused by it and it made me enthusiastic and want to learn. And in any future placements you know – my arterial blood gases were fine, my bloods were fine, everything was fine, it gave me confidence for seeing patients. And by the end of the A & E and minors you might have, you know the SHO sitting in the corner, but you are the one who like sutures and it gave me a lot of confidence. (FGRSC1)

According to both RMC cohorts their most enjoyable teaching as undergraduates took place in the Clinical Skills Resource Centre – the RMC graduates were keen to talk about the resource centre without being asked about it. But what the PRIIOs had really enjoyed was the relationship they had with the staff and the “structured” teaching they received there in contrast to the PBL sessions.

They were always so enthusiastic with the teaching.

There was always someone to point out to you when you had a problem. (FGRSC3)

I wouldn't fault the clinical skills lab at all.

The clinical skills lab was fantastic.

Yeah the lab, I thought it was brilliant. (FGRFC4)

It wasn't just what they learned there that they felt was relevant and good, it was the "atmosphere" created by the staff who worked there in the early years, who they felt they could turn to for help. One group said they provided good "psychological" support.

The old style, they had their firms, they had their certain lecturers they got to know very well and we had clinical skills. (FCRFC2)

I think the clinical skills lab was the one consistent thing on our course...

I thought the clinical skills was brilliant in the lower years. (FCRSC1)

Aside from learning practical skills they felt it gave them a good base for the general skills needed for being a doctor.

The history taking and generic framework- there was definitely a benefit to learning that in clinical skills.

And examinations as well... (FGRSC3)

The A & E placement also gave them an insight into what is involved in being a hospital doctor. It is seen as being at least as important as the "shadow" placement and in fact for many PRHOs offered a great variety of experience and the opportunity to practice diagnosis and management skills.

..but you do need to see real acute patients and best option to see them is in A & E.

That is the scary bit of being a doctor, it isn't like what form to fill in it is like oh!

Because you did a lot of practical skills, you clerked in sick people and decide what to do - their management, which you have to do quite a lot as a PRHO. (FGRFC2)

History and examination skills

There wasn't a specific question to the TMC and first cohort RMC focus groups about history and examination skills. Clerking is a key skill for PRHOs, involving history and examining skills, and not one TMC or RMC focus group mentioned that this was a problem for them. It has already been discussed in this chapter that the RMC PRHOs felt comfortable talking to and eliciting a history from patients and they also felt comfortable practically with patients through their clinical skills experience. Certainly the RMC graduates who had plenty of criticism for their course would have said if they had encountered any problems with this. It has already been discussed that, despite misgivings about science knowledge, the PRHOs had enough knowledge to assess and treat patients up to the level expected of PRHOs which included history and examination. As will be seen in the next chapter their supervisors felt they had these skills and the RMC PRHOs believed they take the appropriate form of action when looking after patients. Also, as has been illustrated in the section above the RMC graduates received good experience in this from their A & E attachments. The RMC PRHOs also had to clerk patients as part of their shadow attachments and were assessed on this. The TMC felt they had good knowledge base which helped them dealing with patients so it can be assumed that they felt they had good examination skills.

Two of the focus groups from the 2nd RMC cohort who were asked specifically felt they had good training as undergraduates in history and examination.

It is like learning to drive and driving, you need to know how to do the basics before you go and do it and we do and we had the basics.

And we went through it very well I think, how we should do it and for a lot of cases we knew how we should do it.. listening to chests so you know what is normal and what is not normal. (FGRSC4)

Primary care teaching

The TMC PRHOs had no views on their undergraduate primary care teaching. Even when they were asked about the content and structure of their curriculum nobody ventured an opinion on the general practice content. This omission in itself was very revealing and will be looked at further in the discussion section of this chapter. Only one focus group very briefly discussed their 4 week undergraduate attachment and that was to say they felt that was about the right amount of time. No TMC graduates mentioned they would have benefited from more exposure to primary care.

By contrast the RMC PRHOs felt that they had too much exposure to the community in the undergraduate curriculum throughout the course and that they felt like they were “being forced” into being GPs.

Because sometimes we just felt like we were being trained to be a GP and not everyone wants to be a GP (FGRFC5)

Just under half of the participants felt they would end up being GPs, some of them pessimistically so, i.e. they would become GPs rather than what they see as a preferred career in medicine or surgery. Many felt there should have been more medicine or surgery instead of General Practice.

I want to be a GP. But if I wanted to be a surgeon I would feel grossly unprepared.....

I think we have had too much. (FGRFC2)

The RMC PRHOs were most unhappy with the teaching in primary care in the early years of the curriculum which wasn't seen as relevant. The projects for the CP2 were roundly criticised as well and the PRHOs questioned the relevance of spending time with health visitors and social workers. There were complaints as well about going on a placement and just spending time doing flu jabs and not learning enough medicine. Others felt that towards the end of the course they had had enough GP.

It came back like a rash. (FGRFC4)

What was of most concern to the PRHOs was that the standard of teaching within the community was very variable (more so than in the hospital) and it was often perceived as poor and the experience largely depended on the GP they were placed with.

In terms of community you know, what you gain depends on who you are with.

If your GP is great you learn loads, if your GP is rubbish you are not going to learn anything.

I remember my 4th year attachment, I hated it, but I think that was because my GP wasn't a very good teacher, she didn't do much.

Whereas my GP in the 4th year was brilliant and she was the most amazing teacher and I am sure she helped me with my finals – it is so dependent. (FGRSC2)

The thing about the GP placement is you get such different experiences which is good, but I am talking like from support from the general practice where we were, but the teaching we received, that sort of thing. I mean some had really rubbish placements.

Others good ones.....

It is too dependent, it is too inconsistent, it depends where you get sent.

Absolutely. (FGRFC1)

Other PRHOs who had positive relationships with their GP in the 4th year also said they received useful support from their GPs and found out useful information to take into their hospital. If you had a “good” GP in the 4th year a good relationship can develop then over the year and the placement was seen as breaking up the week in a positive way. However, those that didn’t resented the experience.

Some RMC PRHOs just wanted either the final year attachment or 4th year, not both (for example some PRHOs would argue the fifth year placement should be optional in the same way SAMPs are), but everyone agreed there needed to be a certain amount of exposure to primary care towards the end of the curriculum. Even PRHOs who were the most critical of the GP placements early in the curriculum realised there were benefits in the final year placement and that the amount of teaching in primary care was right to have increased compared with the TMC. Many PRHOs felt the benefit of community placements and practicing referrals helps to build understanding of the relationship between primary and secondary care. Developing a patient management plan as a GP was seen as good preparation for being a PRHO. In fact many PRHOs developed skills in general practice which they were to find helped prepare them for hospital work as PRHOs.

I think you learn lots from general practice and I am not saying that by doing less in any way dismissing what we learned from it, because you learn a lot about the management of chronic conditions and whether to decide if someone is sick enough to go to hospital or when it can be managed at home and sort of how people’s circumstances interact with their problems as well. (FGRSC4)

In the latter GP placements many PRHOs enjoyed the independence of consulting alone with patients and it helped develop communication skills due to the number of

one-to-one consultations with patients. Some PRHOs felt that undertaking primary care attachments helped you realise what being a GP was really about, therefore helping with career options PRHOs. It was also noted that PRHOs end up doing any “GP” work on the wards and undertake the primary assessment of patients.

It is helpful as a House Officer as well because all the things you get, review this ear, review this throat, all the things which are really GP cases, but because they are in hospital obviously they don't go and see their GPs so then HOs deal with it...there is a lot of GP work on the wards. (FGRFC1)

Learning skills

There wasn't much discussion about learning/research skills/ self-directed skills with the final cohort of the TMC. There was a certain amount of ambivalence on this issue from them and uncertainty about whether an undergraduate curriculum can engender these skills.

Keen people will do well whatever, in the new course if you are not bothered you will still scrape through.

The new course because it is unsupervised they can do as little or as much as they like. (FGT3)

A small number could see the benefits of trying to teach those skills but they were not in the majority.

I see the point of self-directed learning, I think it is a good idea in a way, I remember struggling... prior to finals (FGT4)

Other TMC PRHOs believed they had to be self-directed because of the sheer number of lectures.

Sometimes you just felt so alone you might as well have been self taught. (FGT2)

Where there was agreement was that many of the interviewees felt that RMC graduates will be much better than they were at searching for papers/journals and writing papers.

I wouldn't have a clue how to write papers, they will, but I would not have a clue.

However it is swings and roundabouts because they have had better training in how to educate themselves, and there is a mindset of going looking at things and studying whereas we hadn't. (FGT3)

The graduates from the RMC, however did feel they are self-directed learners and that was a result of the curriculum although they didn't see that as necessarily positive development.

The course has made us into self- directed learners,

We wouldn't be here if we weren't.

It was because we had to be.

I do think we have good learning skills. obviously we have all had to have good learning skills. (FGRSC2)

The last comment was echoed at all the TMC focus groups and enforced the point that they completed their course through being “self-directed” because of their perceived lack of direction in the course. They felt they had good learning skills because they

were “thrown in at the deep end”, setting their own learning agenda in the first couple of years, that they used to call the course “teach yourself medicine”, and this was in stark contrast to their experiences at school.

You have to remember we come from an environment in the 6th form where everything was totally spoon-fed. (FGRSC3)

Many PRHOs also felt that this could help them when they were working for their Royal College exams and that despite wanting more direction there may be some benefit in being self-directed. They also felt that through the SSMS they had developed good literature searching skills. However, despite feeling that they did have the necessary learning skills from the PBL they felt they still would have liked “structured” teaching.

... and we would go anywhere where they said they would teach us instead of where they wouldn't teach us. (FGRSC2)

This area will be looked at in more detail in the discussion section of this chapter and on the following pages.

PRHOs' views about the content of their curricula

The TMC graduates were glad that they studied under their curriculum and were almost “defensive” about it in the focus groups. All the TMC focus groups concluded that there should have been fewer lectures in their course, but having too many irrelevant lectures was for them a better way of teaching science knowledge than using PBL. As already highlighted the TMC PRHOs did feel that the RMC students didn't have as good a knowledge base as them and this was due to curriculum reform.

There was a feeling that somehow the new course is “easier” than their traditional course which may explain why they were so defensive about their education. Some PRHOs felt that the RMC was easier as the assessments were “easier” and that having finals at the end of the 4th year means RMC students can have a “holiday” in the final year with no pressure and can “cruise” along.

It seems like they are trying to turn medicine from a hard to easy course. (FGTR2)

I think if you are not assessed for a full year before your House Officer year, then it is going to affect your performance.

I don't see why they have finals at the end of the 4th year. I think that is just incredible. (FGT4)

One focus talking about their finals explained

We all crammed, it didn't do us any harm,

We started our jobs crammed with knowledge.

They (the RMC students) won't remember anything without finals. (FGT1)

They don't seem to care about patients because they want their core cases. (FGT1)

The final comment implies they felt the RMC students only learn what they need to know for assessment purposes. The PRHOs also believed that they wanted to find out more in order to prepare them for their examinations.

Some TMC PRHOs did feel that curriculum reform was necessary and as, will be illustrated in the discussion section of this chapter, saw flaws in the TMC. But those who did see it as a radical or positive development thought reform had gone too far regarding science teaching and the introduction of other topics in the RMC.

They don't know anatomy and biology, there needs to be more structure.

They may have gone too far with no basic science. (FGT1)

Other typical comments included:

I can't think of a good word to say about PBL without being rude.

And they waste time on public health and history of medicine. (FGT3)

The main difference between the old and new course is if you don't know something on the old course it was your fault because you are meant to know it in the first place.

The new course is just ridiculous. (FGT2)

Another PRHO put it this way.

I don't think the new course would suit me, yes someone like myself, whereas if I went in at 9 O'clock and had lectures all day, an attachment all day, I'd do that Monday to Friday, but if I was told to go away and do a SSM on , say somebody's big toe for 8 weeks then I probably wouldn't do it to be honest! (FGT3)

A number of PRHOs cited the pre-clinical/clinical divide in their course as beneficial.

One group said that not seeing patients for nearly two years made them *chomping at the bit to see them* and it was very *exciting*.

There was also criticism of the SSMs:

The SSMs only makes them experts on some things – one tiny little piece on one subject. (FGT3)

However, despite their preference for their course over the RMC curriculum there were many complaints about the lecture system and some aspects of the RMC they would have appreciated. Many of their lectures were seen as “irrelevant” and all agreed there were too many and this wasn’t always the best way to learn.

Some days we just couldn’t learn anything.

Sometimes we used to sit at the back eating chocolate.

it was a killer. there was too much depth. (FGT1)

A small number of TMC PRHOs even stated that there should have been some, limited number of PBL tutorials to break up the monotony of the lectures.

The quality of lectures was quite poor, we were scared if we didn’t go in and when we did we’d go in and panic we’d think why are we wasting our time with this load of rubbish. (FGT2)

Even if the PRHOs did enjoy the lectures, the workload was seen as immense and didn’t allow time for further reading.

I am not saying you should go to university and have loads of free time, the first year you would have lectures 9-5 with Wednesday afternoon’s off.

But we used to do irrelevant things – it was frightening.

We did unnecessary practicals that the physiology degree students did.

There was far too much

I have never used any of the biochemistry we were taught.

For us it was really brain-taxing learning so much stuff it was just horrendous.

(FGT3)

Although the PRHOs were keen to reiterate the depth of their knowledge, when pressed they conceded that they had been taught a lot of anatomy and biochemistry that was not particularly relevant on a day-to-day basis and some of them hadn't used it at all. But they all still say that, despite being taught things that were weren't really relevant and were forgotten after graduation, they left university with a good basic knowledge base.

They also complained that a lot of clinical attachments later were not particularly useful and it depended on the firm they were attached to.

What you got out of your clinical attachments depended very much on who you were attached to (FGT4).

There was even some sympathy for the RMC graduates though being the first cohort.

They are the ones who have gone through it and many people have told them their course is rubbish.

They haven't got proper guidance...I think they would have liked to have had parts of our course, joined in with the practical things that they do.

I think it is difficult for them because they are like the guinea pig year to a certain extent. (FGT4)

And, as has been illustrated earlier in the chapter, they did recognise some benefits of the RMC in preparing PRHOs.

They will find the everyday almost mundane work of a House Officer much easier and cope better than we did like taking blood, filling in forms, liaising with nurses.(FGT3)

The following quote sums up how the TMC graduates as cohort felt their course could have been improved.

I think if you add the clinical skills they had and fit it into our timetable, cut down the lectures then that would be fine – shadowing as well. (FGT1)

RMC graduates' views on their curriculum

In contrast to the TMC graduates neither RMC cohort was defensive about their course and felt willing to criticise many parts of it despite feeling it gave good preparation to work as PRHOs. There was a lot of concern about the extensive use of PBL in the curriculum and has been alluded to earlier in this chapter they felt was responsible for their uncertainty over basic science knowledge.

They wanted more “direction” and didactic teaching than the PBL sessions offered. They found it disconcerting when PBL facilitators offered little guidance in the PBL sessions especially as they felt that some of the textbooks were still aimed at TMC

students. They would have liked more “guidelines” or “signposts” in the early years in particular.

The views of the first and second RMC cohorts were indistinguishable.

It is very hard when you are 18 or 19 and have got no idea how much detail you need to know, and that is what put me off. Nobody would give any advice because it was against the spirit of the whole course. (FGRFC5)

You have 6 or 7 people who have just got out of A level and have got no idea what is relevant in medicine and you are not getting any, er I think in the first year you still need to have some direction of what is relevant. (FGRFC3)

It also needs direction – they were so against having a syllabus we never actually had a clue what the exams were going to be related to and whether they were going to be related to reality. (FGRSC2)

In the first year anyway....you don't always twig....you don't really understand what the structure is, you haven't taken a history, you haven't seen a set of notes before, you haven't done anything really. (FGRSC4)

The idea that 18 years olds are going to come from home and get into this course designed for postgraduates where you do all your own learning, yourself and you are going to be that dedicated and do it all.

Its is a good idea, but it is not linked to reality

You have to have PBL linked with some basic training in physiology, biochemistry and anatomy. You need some teaching.

You have to have some basic teaching – it is ridiculous. (FGRFC2)

They felt if there had been more “structure” i.e. more lectures, plenary sessions or more clearly defined learning objectives this would have given more certainty over knowledge acquisition. However, by the 4th year, the PBL sessions were seen as more relevant as students then had a clearer idea of what depth of learning was needed. They did feel as well that a lot of time was wasted particularly in the first year where they only had 9 hours a week or so and more structured teaching would have given more confidence in knowledge acquisition. They felt that if they had had more structured teaching it would reduced some of the stress from taking a degree in medicine.

The RMC graduates also felt that they had under-utilised the HARC which could contribute to their lack of confidence over anatomy.

In the real world 200 18 year olds aren't going to go because it isn't compulsory and there is no anatomy exam at the end of the year. (FGRFC2)

The PRHOs felt that HARC could have been utilised more by being more like the clinical skills lab and having more organised teaching sessions because:

The thing is it is very hard to teach yourself anatomy...it just became a drop in centre so you try and go along and I just became really frustrated.

It sounds good this theory of open all hours, you know HARC (Human anatomy resource centre), but nobody goes.

You have a load of 18 year olds fresh out of school being spoon fed for the last 13 years of their education and you stick them in a room with some dead things and some books. Do you know what I mean? (FGRSC3)

The first RMC cohort felt they suffered from being “the first cohort”, that there wasn’t enough organisation in their course and that many consultants weren’t sure how or what to teach them when they arrived in the hospitals.

It was very weird constantly being the first year. (FGRFC2)

I think our course is going to be a very, very good course. I think we were just unfortunate to be the first year of it really. (FGRFC1)

Also, it was thought that the Faculty should have been more organised and more integration between the community and hospital placements.

Huge lack of communication between the hospitals and community, you never knew who were supposed to teach us.

It was a nice course to do, just a battle between the hospitals and community, you never knew what was going on. (FGRFC5)

This last comment was quite indicative. They were actually quite glad to have done that course and would have preferred it to the lecture-based course as it was (although would have liked some of the lectures in there and less community) but were frustrated by the problems. Even when the PRHOs were asking for lectures they weren’t advocating a return to the “old system” per se.

I like PBL, I would do it again. It is a good principle, but it needs to be backed up by more solid learning. (FGRSC4)

Both RMC cohorts were very critical of their course but they didn’t seem totally to have regretted doing the Liverpool course. Though as one participant put it,

I think the Liverpool course is what you make of it. You can do nothing or you can do everything. (FGRFC2)

But it wasn't just the PBL itself that contributed to their worries over basic science knowledge base. The biochemistry and physiology practical sessions were seen as "lightweight" and "uninspiring". The plenary sessions they had were also seen as a "wasted opportunity" (like the SSMS they were seen as being of very variable quality), not only for the perceived lack of content in some of them but because they weren't compulsory many PRHOs failed to attend when they were students.

All the PRHOs had experienced as undergraduates consultants who had derogatory views of the PBL course, which they had heard throughout their years as undergraduates and had been unnerving to some.

I think the worst thing is the people who have done the old course and done the old style looked at us and don't see how we can be compared with them.. if your seniors... not have faith in you.. then that is worrying. (FCRSC1)

Also, they had shadowed TMC graduates who had similar views to the some of their consultants about the RMC, although they felt as they began working as PRHOs they felt they gained more respect from some of the sceptical consultants.

I think the consultants did complain at first, but now they just see us as doctors, no one looks down at us. (FGRFC3)

Another said they had been proving the doubters wrong by working hard as PRHOs.

The Special Study Modules (SSMs) also came in for criticism. Many thought they were a good idea, but the marking was seen as unfair or unpredictable, with some participants feeling they had worked really hard on one SSM and only received a pass and felt they saw other students doing less work, yet receiving a distinction. Some of the SSMs were also seen as “boring” or poorly managed.

If you ended up with one that you didn't even put down because you thought it was particularly boring then it was bad...I did very badly in one as a consequence as I just wasn't interested. (FGRSC4)

One group concluded:

They are so variable as well; the whole distinction/merit thing.

The system of marking was shocking!

They are so variable, the standard, the standard of the marking of the actual standard of the SSM you do is completely variable. (FGRFC2)

However, it was recognised by all the RMC PRHOs how valuable it is to be able to undertake a literature search which they all felt competent at as a result of their SSMs.

The PRHOs also expressed concerns about the RITA system of assessment in the final year. For many PRHOs the process does have the advantage of taking some of the stress away from the final year (i.e. no written exams or OSCEs) and many admitted the 4th year by contrast was quite stressful as a result. Generally, the PRHOs are comfortable with the fact there is assessment through portfolios (although a minority would like some formal assessment at the end of 5th year, like for example having long cases) but not many were convinced it was being carried out properly when they were students. Many PRHOs had some concerns about how seriously some of their

supervisors took the process. Everyone had different experiences depending on who their consultants were. Some for example were interrogated like a viva, others had consultants who gave it a “cursory glance” when it came to their RITA meetings. What concerned the PRHOs most was the variability in attitudes between different consultants.

I think it does depend on your consultant because I have had some consultants who, like every week will review cases really well, some who are a quick flick through your folder and a quick chat, I'll sign you up off you go – and others who read, you would sit at the RITA for an hour and a half while they religiously read every word and asked you loads of questions – it depends on your consultants. (FGRSC4)

The portfolios have been evaluated by another project run by the School of Medication Education (Fewtrell 2007) which has come to similar conclusions although the portfolio has been adjusted since these cohorts were in the final year. The PRHOs felt that overall the assessment didn't reflect the hard work they were undertaking and were often distracted looking for their “core cases” rather than actually learning about them.

The 4th year – you just ran round looking for cases you never got. Instead of seeing, say 5 cases of breast cancer... different presentations of each one you would go and clerk one and that would be oh I have got my breast cancer I don't need to see anybody else. (FGRFC5)

A small number of PRHOs believed that the final exams should be split into the 4th and 5th year to stop enthusiasm plummeting in the final year and negate some of the problems with the RITA forms.

There is nothing wrong with examining people because it forces them to go off and do some work. (FGRSC3)

RMC PRHOs' recommendations for the course.

Firstly, as had already been illustrated, both cohorts of RMC graduates would have liked less communication skills and community placements in the early years of the course. It has also been shown that many of the PRHOs would alter the structure of the final year, for example extending the shadowing attachment to medicine and surgery. But for the PRHOs the most important aspect would be to have some more “structure”, “guidelines” or “signposts” alongside PBL in the first couple of years to assist the acquisition of basic science knowledge.

I think the first two maybe three years of the course were just too unstructured for someone out of school.. I don't think an 18 year old can cope with the lack of structure and I think it has improved since we went through.

You need to be taught, you need to have a structured curriculum and that is the best way to learn.. I think the self-directed learning skills we should develop are really important and there is no reason why they shouldn't be encouraged... but just to drop it in the first year and say there you go. (FGRSC4)

This “structure” would help them to know what is relevant for them at the time and for what they will need to know 5 years later. There was a mixture of views about how this “structure” could be achieved. They weren't saying that PBL should be moved out of the course at all or there shouldn't be a strong element of PBL within the curriculum.

You have to have PBL linked with some basic training in physiology, biochemistry, anatomy. (FGRFC1)

Some PRHOs felt it should be “60-40” in favour of PBL in the first year, but this could increase in the second and third years. Another group suggested there should be a lecture in the morning, followed by clinical skills and PBL with a lecture to finish off the day. All the RMC PRHOs agreed there should be more lectures to run with the PBL sessions and there should be at least one, maybe two a day and unlike the plenary sessions they had –these “lectures” should be made compulsory. The PRHOs would expect from these lectures basic clearer guidelines of what they should aim to know from their self-directed learning.

Alongside their wish to see more “structure” within PBL was a desire for more formal anatomy teaching. This view was strongly reinforced by everyone who took part in the focus groups and if the anatomy lab had been organised along the same lines as the clinical skills lab then they would feel much more confident in their anatomy knowledge. Also, they suggest that the biochemistry practical classes should be carried out in smaller groups. But as one PRHO summed up:

I think it has just swung back too far the other way – they have gone from too much rote teaching to completely go away and fend for yourselves and I think it just needs to swing back a little further and the course will be great. (FGRSC2)

Discussion focus groups

There were, of course, some limitations to the focus groups. With hindsight there should have been more specific questions on history and examination skills, although as has been discussed, the subject was mentioned in the focus groups and covered through discussions in relation to other questions. It has already been inferred in chapters 5, 6 and 7 that some of the questionnaire results can be put down to the change in the curriculum and it is possible to tie the focus group data with the questionnaire results. One limitation of this was that there wasn't enough time in the focus groups to focus specifically on the results of the questionnaires and ask the PRHOs about them. However, it is possible to explain some of the results of the questionnaires, such as the percentages pertaining to "understanding disease processes" and "communicating effectively" for example, through the focus groups.

Also, there wasn't time to cover in detail everything that was mentioned in the focus groups such as their views on the roles of different health care professionals. This topic was covered very briefly and the small amount of data gathered showed that graduates in particular had a poor view of their interprofessional understanding (Watmough *et al* 2002) and the questionnaire results and supervisor interviews demonstrate the RMC PRHOs had a good understanding of the roles of the other health care professionals.

It was decided not to look at factors involving career choice and this was a deliberate choice as it might have been too personal a topic to be discussed in a group environment. Also, many graduates wouldn't have decided on their final career choice

at that stage of their career. The influence of medical school on career choice has been covered in the next stage of this project (Watmough *et al* 2007 a). The PRHOs spent the majority of the focus groups talking about the topics that are covered in the main section of this chapter. As there was only an hour for each of the focus groups it was important that the pre-selected topics were covered in detail. More information than was collected on the RMC itself than the TMC and that wasn't just because there were more focus groups with RMC. The TMC PRHOs were very keen to talk about the RMC and perhaps this is understandable given that they knew that their curriculum had been abolished by the time they took part in the focus groups.

There is always the possibility of bias in focus group research (Krueger 1997, Agar & MacDonald 1995) but this was minimised by the way the groups were recruited. The totals in the focus groups were only a small proportion of each cohort 29/166 for the TMC; 33/190 for first RMC; cohort and 21/195 for the 2nd RMC cohort. However, the male/female content of the focus groups (listed on page 175) was very similar to the male/female ratios for the cohorts as a whole. Historically, medical students were overwhelmingly male but at the time of curriculum reform the number of females entering medical school was rapidly increasing (Morrison 2006). Although it was purely by chance that the balance of males and females was fairly representative of the cohorts as a whole there was no pre-selection to focus groups. Also, as they were held during protected teaching time which PRHOs have to attend, anyway it would have made pre-selection of the groups and sampling difficult to arrange.

As has been discussed in chapter 4 the most successful groups are those with a homogenous population and no one in authority present (Agar & MacDonald 1995).

Just how homogenous these groups were is illustrated by how quickly saturation of themes was met and the lack of differences in views between the focus groups. The differences were between TMC and RMC graduates not focus groups from the same cohort. This also demonstrated that the PRHOs found the questions relevant and could discuss them easily. If they hadn't felt the questions were relevant there could have been more divergence of views. As SW had no management position within the University and was a non-clinician, the PRHOs were comfortable to talk in front of him. If he had been a clinician or had management responsibility within the University this might not have been the case and led to more chance of biased or influenced answers in the focus groups (Norris 1997).

There were virtually no differences between the first RMC and second RMC cohorts in what they actually said about their curriculum or preparedness for the PRHO year. In one respect this may have been expected but it was important to gauge the views of the second cohort as there may have been a "first cohort effect" with the first RMC PRHOs. Other research has shown there were differences in attitudes between the first and second cohorts as 1st year students so it was felt that the views of the 2nd RMC were needed (Lloyd-Jones 2002). This thesis suggests that over the period of undertaking the course the views of both RMC cohorts have become closer to each other – possibly as a result of the clinical attachments of the course as both cohorts were subject to the same negative comments by their supervisors on those attachments. One suggested area of further study to come out of this work would be to examine the views of graduates who started their course when there were no traditional graduates above them and all the undergraduate and postgraduate supervisors had more experience of teaching students from a RMC. Even when the

second cohort of RMC students were graduating all their supervisors would have been educated under a traditional system and been used to teaching students from a TMC.

The TMC students were “defensive” about their curriculum and in fact the TMC PRHOs spent much of their focus groups criticising perceived failings in the RMC. This isn’t really surprising as the TMC graduates were the last cohort of the TMC and perhaps they felt throughout their 5 years as undergraduates more concern or attention had been focused on the RMC graduates below them and maybe they were threatened or unnerved by curriculum reform. Although they were often not exactly sure about content and rationale behind the RMC they were sure that their curriculum was better than the curriculum that replaced it. The TMC PRHOs’ views on the RMC may also have been shaped by having some supervisors telling them that their curriculum was a “better” curriculum. If the TMC graduates knew that the RMC students themselves, and the consultant supervisors had concerns over knowledge base of the RMC students then that may be one reason why they were keen to stress that their knowledge was good. It is probably fair to say that at the time they felt quite threatened by the RMC and possibly jealous of the attention given to the RMC students below them.

The first two cohorts of the RMC weren’t particularly defensive of their curriculum and were quite critical of it. Again this is perhaps to be expected. Whereas the TMC would have been unnerved by the attention on the RMC, students from the RMC may not have welcomed the attention. It may be fair to say that they felt under a lot of pressure being the first cohort to go through a new course. They were constantly made aware of this fact, if only through the fact they constantly felt that they were being evaluated all the time due to the number of questionnaires they were asked to fill in.

Also, some PRHOs felt that they had told the Faculty of Medicine how the course could be improved but not a lot of notice was taken. Although with them being the first cohort of the new course, there probably wasn't much that could have been done to change the course for them at the time. One PRHO said, after the focus group had finished that they do defend their course usually, i.e. to other doctors or friends, but not to people from the University.

The attitudes displayed by the TMC and RMC graduates are understandable to a large extent and these attitudes have been displayed at other medical schools by students whose curricula have been reformed. (Cohen Schotanus *et al* 2004, Kuhnigk *et al* 2004). There were inevitable problems being the first students to go through brand new curriculum. This kind of curriculum was very new in the UK at the time and the content of the curriculum was still being compiled as the first cohorts were beginning the course.

As one consultant put it; *there is no way I would apply for a new course, I would wait a few years for it to settle down.* (S15)

As two PRHOs said in one of the focus groups about the consultants;

They do not really understand the PBL course do they? When they say that about the knowledge because it is not the way we learn any more. You would have thought that through the Deanery or whatever all the consultants would know what is going on and have an input into it.

I think other years might find the PBL better, just because people who organise it will know what it is about, because they didn't know and we didn't know. (FGRFC4)

The PRHOs might also have been influenced by the fact that many consultants in the Mersey Deanery area, for a variety of reasons (see next chapter for a fuller discussion), are (or were when it was first introduced), hostile to the RMC. All the PRHOs at some point during their undergraduate years had been told by someone senior that their course wasn't good enough. Consultants are not always in favour of curriculum reform and the introduction of PBL (Maclean 2003) and often students arrive unprepared for clinical teaching (Hendry *et al* 2005). There will be a fuller discussion of this in the next chapter.

Despite their concerns about their curriculum both cohorts of RMC students felt well prepared for the role of PRHO and much better prepared for the role than TMC graduates. It seemed there were different expectations on how it was possible to be prepared for the PRHO from traditional and reformed curriculum graduates with the TMC graduates accepting that they weren't that well prepared for their course for the day to day jobs.

The hypothesis behind this thesis is that the RMC will produce PRHOs who are better prepared for the role and the focus group research bears this out. The lower expectations behind the TMC PRHOs may have been that there is little in the TMC that specifically prepared them for the role of PRHO. The RMC graduates felt they were better prepared and they attributed this directly to their undergraduate curriculum. The final year placements and in particular the shadowing and A & E placements, clinical skills resource centre, communication skills tuition and to a lesser extent GP attachments had prepared them for the role of PRHO. It has been illustrated in chapter two that there was a feeling that traditional curricula were not adequately

preparing graduates for the role of PRHO and the RMC graduates were better prepared than RMC graduates. As focus groups can cause more negative comments than other research methods (Kitzinger 1995) the RMC PRHOs would certainly have taken the opportunity to say if they hadn't been well prepared. The questionnaire data for the "general" question of how well prepared they were for the PRHO year showed significant improvement between TMC and the RMC PRHOs. These focus groups show why the RMC graduates felt better prepared than their traditional counterparts.

The "shadowing" attachment has also met its objection in preparing students for the role of PRHO. It was called for by the GMC (GMC 1993) and has seen to be a success at other UK universities (Lempp *et al* 2004, Jones *et al* 2006). The TMC graduates felt they would have benefited from a shadow placement. Although it has been shown that there are disagreements about the length of shadowing from both TMC and RMC graduates and whether shadowing should involve medicine and surgery, it is seen as vital for students in preparing them for the PRHO year. As such it is one of the most important components of the RMC.

Without it the RMC PRHOs will not have felt as prepared as they did for the house officer year. As will be illustrated in chapter 9 the educational supervisors also feel that shadowing has helped improve preparedness for the PRHO year. There were slightly different views on the shadowing from the TMC PRHOs who didn't have a shadow placement and the RMC graduates who did. Although assessment and overall responsibility for this attachment lies with the consultant, it is the PRHO who has most of the day-to-day responsibility of supervising the final year medical student. As with all apprentice-based learning (Lave & Wenger 2002) one of the issues will be

whether both apprentice and master have a joint stake in the increasingly knowledge and skill level of the “apprentice” (Goody 1982). In some ways the attitudes of the TMC graduates may have been expected – they wouldn’t directly benefit from having a medical student attached to them as it was unlikely they would still be working on that firm when the student graduated. Certainly, the literature shows that apprentice based learning is beneficial for learning “the tricks of the trade” and the actual “culture” of a profession (Lave & Wenger 2002). This is very much what the shadowing attachment entails and the RMC PRHOs in the focus groups did say that that they knew exactly what was expected of them on day one of the job.

Lave & Wenger (1991) also discuss the process of situated learning which involves a process of engagement in a “community of practice” where people in the workplace are brought together by common activities. Shadowing can be seen as formulating an educational tradition within medicine whereby the graduates were expected to be become part of the team and learn the role of junior doctor simply by working on the wards. Now, the shadowing “forces” students to learn what is like to work as a junior doctor prior to graduation. Initially, people join communities and learn at the periphery but once they more competent they move more towards the centre becoming “legitimate peripheral participants” (Lave & Wenger 1991). It can be argued that this is what the shadowing achieves. This can be illustrated by the fact even the TMC graduates said that by the end of the shadowing placement the RMC students were comfortable undertaking the tasks that would be expected of them after graduation.

The TMC graduates did feel that their science knowledge base helped them in the role of PRHO. The TMC also felt that the RMC PRHOs were at a disadvantage compared with graduates such as themselves who had received a “traditional” undergraduate education. The TMC PRHOs, despite their complaints over the lecture system felt it had given them a good science background. In this respect there was clear agreement between TMC and RMC PRHOs about why there may be a deficiency in science teaching in the RMC as both types of PRHO felt more direction with the PBL would be advantageous – even those TMC PRHOs who had no direct experience of PBL.

It has already been discussed in chapters 3 and 7 that the introduction of PBL into a curriculum can create uncertainty over basic science knowledge. Reducing the “factual burden” on students and introducing problem-based learning has produced mixed results regarding science knowledge and this is a well-documented concern in the literature surrounding PBL (Albanese & Mitchell 1993, Michel *et al* 2002). 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 (Prince *et al* 2003, Prince *et al* 2005a). Antepohl *et al* (2003) have shown that in the longer term Swedish PBL graduates haven’t felt hindered regarding basic science knowledge undergoing a reformed PBL curriculum. McKeown *et al* have shown there is evidence of a lessening of anatomy knowledge after the move from a traditional type course (McKeown *et al* 2003). PRHOs from the University of Manchester (Jones *et al* 2002 Jones 2003) also expressed concerns compared with their traditional counterparts after the introduction of PBL in Manchester. There have also been concerns in the dental profession about the level of basic science knowledge although dental students who undergo PBL training in Liverpool have no reported deficits of science knowledge

compared with traditional students (Last *et al* 2001). It remains to be ascertained what level of basic science is needed (Clack 1994) (Rudland & Rennie 2003) in undergraduate medical education as guidelines are not clear. The guidelines from the Quality Assurance Agency in the UK and the EU pertaining to undergraduate knowledge level are not specific (Leinster 2003). One interesting quote from an updated version of *Tomorrow's Doctors* (GMC 2002) states: ***Factual information*** (original emphasis) *must be kept to the essential minimum that students need at this stage of medical education.* The PRHOs may feel they need more basic science knowledge than they actually do require.

It has 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 (Kaufmann & Mann 1999). 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. The RMC graduates demonstrated some stress over basic science acquisition and it has been shown PBL students in the UK can find, particularly in the first year, the format and “uncertainty” of PBL sessions stressful (Moffat *et al* 2004). Although other studies (Kiessling *et al* 2004) have demonstrated that PBL students were felt less stress than traditional students.

The TMC graduates felt that their examinations were more difficult than the assessment procedures in place for RMC students and this had played a part in their confidence over knowledge base. Final year exams have been shown to be stressful (Radcliffe & Lester 2003) and were one of the reasons for curriculum reform (GMC

1993, Lowry 1992) but the PRHOs themselves felt it had given them an advantage concerning science knowledge. The RMC graduates had certain complaints about their portfolio in the final year although few specifically said it had contributed to their lack of basic science knowledge. However, unlike the final year of the traditional curriculum, the portfolio specifically lists the key skills PRHOs are expected to undertake. It could be that this, combined with their clinical attachments has helped the RMC feel confident in gaining the skills needed for the PRHO year. Certainly portfolios tie in with the recommendations in Tomorrow's Doctors in trying to promote adult learning and relating education to experience (Snadden & Thomas 1998) and there has been an argument for increasing their use in undergraduate education (Rees & Sheard 2004). From the evidence collected in this project it would be hard to say definitively whether portfolios have impacted on the preparedness of students for the PRHO or basic science knowledge base. The arguments around this have already been examined in chapter 7 and the views of the supervisors to portfolios will be discussed in chapter 9.

The RMC PRHOs certainly felt they had good practical skills and in fact they felt this was their strength as junior doctors. The TMC graduates had to learn a lot of the skills on the job and hadn't learned them as undergraduates or it was very varied what they learned as undergraduates. One of the reasons for curriculum reform was that to improve the practical skills ability of graduates. The RMC graduates felt more competent in this area due to a combination of the clinical skills resource centre and their final year placements where they got to practise these skills on patients. It has been shown that although many medical schools employ resource centres such as the one at Liverpool there is still no definitive proof about their effectiveness (Bradley &

Bligh 2005). The research in this thesis suggests the Liverpool resource centre has met its objectives in preparing students for the PRHO. This view is reiterated by the educational supervisors (see chapter 9) and by the TMC graduates in their focus groups. This also proves the value of using mixed methodologies as the quantitative data alone wouldn't have demonstrated an improvement in this area.

A & E placements have been shown as useful clinical centres in which to prepare for and to hold OSCE examinations as students tend to be exposed to a range of clinical skills in A & E attachments (Johnson & Reynard 1994). Certainly the RMC PRHOs stated that they enjoyed a wide range of extremely useful clinical exposure there. They also felt that the A & E final year placement was just as valuable as the Clinical Skills Resource Centre and shadowing and was an embodiment of those placements. They could practice practical procedures, diagnosis skills and felt that the placement gave realistic practice for being a doctor. For these PRHOs it has been invaluable placement.

One aim of curriculum reform was to encourage lifelong learning and deliver competent learning skills (GMC 1993). Although there has been concern raised about whether PBL is meeting this aim (Norman 2004) it is still a key aim of PBL curricula and is a clear expectation of the GMC (GMC 2002). The evidence is far from clear either way in the literature. Some reviews believe that there is no evidence PBL had improved the skills of graduates in this area (Colliver 2000), whilst other studies say that that self-directed learning skills are enhanced and retained. (Finucane *et al* 1998) (Dolmans & Schmidt 1994, Wolf 1993). The RMC graduates firmly believed that the PBL element of the course has engendered in them "self-directed" learning skills and

that this could be beneficial later in their career, particularly when sitting professional exams. They did not see the learning skills they had as something particularly to be proud of and felt that it had been “forced” on them. It could be, of course be that they only truly appreciate this ability further on in their careers. Many of the TMC graduates feel that the RMC graduates will have better literature searching skills than they have. This may be conducive to the ideals of lifelong learning, and the follow up study to this thesis will carry out further research in this area. The majority of supervisors had noticed some difference in the PRHOs regarding learning and study skills and this will be discussed in the next chapter.

For the TMC graduates the issue of community-based medical education was hardly covered in the focus groups which in itself can be seen to tell its own story. The RMC graduates had plenty to say about their community placements and a large part of this was negative. Negativity to community-based curricula and uncertainty about the values of community training have been reported elsewhere (Rosenthal & Ogden 1998) (Howe & Ives 2001) and the General Practice in the RMC will be looked at again in more detail in chapters 9 and 10. Many of the hospital supervisors felt there was too much community and as with the knowledge base this may have impacted on the RMC PRHOs.

However, the RMC PRHOs, despite feeling there was too much community teaching in their curriculum, recognised that they certainly should have had more than the 4-week exposure offered in the traditional curriculum. They believed they had a good understanding of the role of primary care medicine and this was borne out by the questionnaire results from the supervisors (cf chapters 7 and 10). One of the aims of

increasing community education was to improve understanding of primary care (GMC 1993) and in this aspect it has worked with the RMC students. Also, the PRHOs felt that some of their undergraduate placements in primary care were useful preparation for working as PRHOs and gave them transferable skills which they could use whilst working in the hospitals. So despite the criticisms of general practice there were some positive views about community-based education and how it has helped to prepare them for the PRHO year.

The RMC graduates also felt there were too many communications skills classes in their course and were critical about this. However they did find they used this training when communicating with patients and their families. The TMC graduates did feel they were good communicators but this was down to doctors having that ability. This isn't unusual and other UK medical schools have found that graduates from a curriculum which incorporate communication skills training have a different view of conceptualising these view compared with traditional graduates (Willis *et al* 2003). It has been demonstrated that students in the past didn't just automatically acquire communication skills training (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). It has also been demonstrated that communication skills are important in improving patient outcomes (Roter *et al* 1995) (Wagner *et al* 2002) so the fact that the RMC graduates recognised the value of this training can be seen as encouraging. As has been discussed in chapter 7 and will be looked at again in the following chapter the supervisors also feel the RMC has improved communication skills in graduates. The questionnaire results for the "communicating effectively"

have showed that both TMC and RMC felt very competent in this area but the focus groups have shown there are different reasons for this.

The PRHOs in all the focus groups have given very frank and candid views about their undergraduate education and clear distinctions can be seen between graduates of both types of Liverpool curricula. At one level they do show that curriculum reform can change the attitudes and views of PRHOs to medical education. Both RMC and TMC graduates attitude to medical education were clearly shaped by their curricula. They did, though, share similar beliefs there should be more structure in the RMC and share beliefs about the value of the Clinical Skills Resource Centre and the importance of the “shadowing” placement, although both RMC and TMC PRHOs came at those views from a different angle to each other. Despite the concern surrounding knowledge base and the criticisms of the RMC, the PRHOs from the RMC said they felt better prepared for the role of PRHO than their traditional counterparts which give credence to the central hypothesis to this thesis. This chapter has given qualitative in-depth data on how PRHOs view their medical curriculum and how it prepared them to work as junior doctors, the following chapter will summarise the views of their educational supervisors.