HOW AND WHY RURAL GPS COMMIT THE TIME TO PRECEPT MEDICAL STUDENTS

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SUMMARY

This thesis defines the time impact of precepting medical students on rural general practitioners and explains how and why they commit the time to precept. To answer this question, original research was undertaken within the context of the innovative community-based medical education program, the Parallel Rural Community Curriculum (PRCC), using the parallel consulting model. Chapters One to Three detail the context of this study, appraise the existing evidence in the literature, and establish the rigour of the study design. In line with the constructivist theoretical perspective presented by the author, a case study methodology was chosen for this study. The thesis is constructed in two parts.

Results from a prospective cohort study of GPs' videotaped consulting, with and without students, are described in Chapters Four and Five. No increase in consultation time or non-consulting time was found when precepting medical students. GPs' activities changed, suggesting they adapted their behaviour when students were present.

An interpretive study, using a grounded theory approach, was used to explain the 'how' and 'why' of the research question. Interview data from GP preceptors, practice managers and students was used to construct a transferable explanatory theory as it emerged from the data. These results are presented in Chapters Six and Seven.

The majority of GPs considered precepting more time consuming than consulting alone. This finding was not consistent with the videotaped data. GPs consistently

experienced time pressure in their roles due to constant intrusion of competing priorities. This increased when precepting students. Frequent descision making by GPs as a response to their drive to remain on time was found to be a significant contributing factor to the changes found in consultation activities.

Although many types of professional enrichment were identified by GP preceptors as adding value to precepting, the doctor-student relationship was clearly defined as the most important motivator for precepting in this study.

The case study analysis explains how and why this occurred, and documents the maturation of the doctor-student repationship over time in the year long PRCC attachments. Through a grounded theory analysis of the data, four precepting consultation models emerged: student observer, teacher-healer, doctor orchestrator and doctor advisor. In Chapter Eight, the study defines these models in the context of legitimate peripheral participation of a novice member of the rural GP community of practice. The corroborative evidence from the literature suggests that these models may be applicable to other settings, particularly other community-based medical education sites.

DECLARATIONS

I certify that this thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief, it does not contain any material previously published or written by another person, except where due reference is made in the text.

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1 INTRODUCTION

The aim of this thesis is to define and explain the time impact of precepting medical students on rural general practitioners in a general practice setting, in order to answer the following question "How do general practitioners respond to the time impact of precepting medical students?"

This study presents findings from original research based on an innovative undergraduate medical education program: the Parallel Rural Community Curriculum (PRCC).

Before describing how the original research has been used to answer this question, the significance of this question is outlined.

1.1 Trends towards rural community-based medical education

Rural and remote communities internationally have less access to medical services than urban populations in their countries.[3] The gap between urban and rural access to general practice services has widened in the last decade.[4] This trend has been recognised in developed countries as a rural medical workforce crisis.[5]

One of the main policy developments internationally has been to educate medical students in rural areas.[6-9] The rationale for this is based upon the premise that

exposure to a rural environment as a medical student has a positive influence on the recruitment of doctors to work in rural areas.[7,8,10-13] Recruitment of medical graduates to rural areas has been on governments' and universities' agenda since the 1990s.[14]

In Australia, the Rural Clinical Schools (RCS) initiative was introduced in 2001 by Hon. Michael Wooldridge, Minister of Health, to strengthen the rural focus in medical schools.[15] The Department of Health and Ageing funded universities to provide a minimum of 50 per cent of clinical training in rural and remote areas to 25 per cent of the domestic medical student cohort.[6] Since 2000, the annual intake of medical students has increased from 1200 students per year to over 3000 students in 2009.[16] In 2009 there are 14 rural clinical schools and three medical schools in rural Australia.[12]

Community-based medical education, based primarily in general practice, has developed in Australia in the last decade as a response to three important pressures. First, following the establishment of rural clinical schools and new medical schools based in rural areas, there has been increase pressure for rural clinical placements requiring the development of further placements beyond traditional regional hospital settings.[12,17] Second, universities have recognised that medical students have limited exposure to the breadth of medical conditions when based in tertiary hospitals.[18-20] Third, rapid patient turnover in tertiary hospitals has eroded the development of meaningful student-patient relationships, and reduced the capacity for students to have an authentic role in patient care within these environments.[21] Community-based medical education (CBME) models embed students in primary care settings from where they can follow patients and doctors into the hospital.[22]

The pressures described above have resulted in the development of other training models, including longitudinal integrated clerkship models. An international collaborative known as the Consortium of Longitudinal Integrated Clerkships (CLIC) has developed a consensus definition for these programs as having the following features:

- students participate in comprehensive care of patients over time
- students participate in learning relationships with the doctors who care for these patients
- through these continuity experiences, they meet the majority of core clinical competencies for their respective medical schools across multiple disciplines simultaneously.[23,24]

Longitudinal integrated community-based medical education models are now found in Australia, United Kingdom (UK), United States of America (USA), Canada and New Zealand. [9,22,24-27]

Worley, Esterman et al [28] demonstrated the academic credibility of a rural, community-based, longitudinal integrated progam, by showing that student attainment of educational outcomes in the initial PRCC program at Flinders University was at least equivalent to attainment of students undertaking the tertiary teaching hospital rotations. This outcome has been confirmed in other ambulatory care and rural programs.[29,30]

Although there has been some development of urban community-based integrated clerkships, the majority of established programs in Australia and internationally to date are within rural areas as the breadth of practice of rural generalists has allowed

students to navigate the interface between primary care and hospital contexts more easily.[31,32]

1.2 Implications for Australian rural general practitioners

In the Australian health care system, GPs work primarily in private practice consulting rooms. Patient services are provided on a fee for services basis. Fees are subsidised by a Medicare reimbursement to patients or through a co-payment to doctors. The Commonwealth government provides additional payments directly to doctors through the Practice Incentive Payment (PIP) scheme. This rewards practices for public health surveillance outcomes, chronic disease management processes and additional activities such as taking medical students on clinical placement. Many rural GPs are therefore both health professionals and small business owners or private service contractors.

Medical schools with community-based longitudinal integrated programs, such as the PRCC, have developed partnerships with rural general practitioners (GPs) to provide students with access to clinical experiences. Previous studies have demonstrated that clinical supervisors may be the single most important factor in student learning in a clinical setting.[33] To ensure the stability of these relationships, it is important for medical schools to understand the implications for GPs in committing to community-based medical education programs, and support these doctors to develop effective models of supervision which meet the needs of patient, doctor and student.[34,35] This is particularly important in rural areas where rural doctors are already burdened with excessive workloads, possibly resulting in less time to supervise students than in

urban practices.[5,36] Subsequently rural doctors may be less interested in providing medical students with clinical opportunities.[36]

In 2004, the demographics of the Australian rural general practitioners were reported to include 27% females; 25% overseas trained doctors; and 40% of GPs were over 50 years of age.[5] In South Australia in 2007 rural doctors had an average age of 45 years, with 27% being female and an increasing number of international medical graduates (33%) making up the diminishing workforce.[37] Despite heavy workloads, 87% of rural GPs in South Australia described having medical student attachments in their practice on at least one occasion annually.[38] This is similar to the rate found in UK studies[39] and a significantly higher percentage than found in USA.[40] Significant numbers of non-teachers described having never been asked to take a student [40] and this correlates with the finding that doctors closer to a medical school were more likely to teach.[39]

No data were available to define whether gender age or racial background ratios were different in teachers compared with non-teachers in rural or urban Australia, but studies from USA and UK consistently found GPs with undergraduate teaching experience were younger and more likely to have a "western" medical school degree.[39] There is a possible relationship between interest in teaching and a GP's career stage. It seems doctors are more available to teach early in their careers, before family and practice demands grow; or later, when these demands have reduced.[41] This is not however a consistent finding.[39,42]

Supervision of students tends to be a shared responsibility in Australian rural practices.[42] Solo practitioners are under-represented as teachers, however the size of

the practice does not otherwise affect whether or not GPs are involved in teaching.[39,42]

As described above, medical schools rely on primary care doctors continuing to accept medical students in their practices in order to develop and sustain community-based medical education programs. It is essential for these institutions to understand the motivators and inhibitors of their clinician partners in order to facilitate preceptor recruitment and retention. More importantly, these same levers may also influence the student learning experience as the quality of the relationship between GP preceptor and trainee is probably the single most important factor for effective supervision.[35]

1.3 Preceptorship

In this thesis the word *precepting* will be used to describe the role of GPs working with medical students within the Parallel Rural Community Curriculum rather than more frequently used terms including *supervising, teaching, educating* or *mentoring* for the following reasons. Although the role of GP preceptors includes clinical supervision, the term *supervision* only describes monitoring of students' professional behaviour and clinical activities to ensure patient safety and assess quality. This term fails to account for the role GPs have in progressing student learning. GP teacher or GP educator infer didactic instruction of students as opposed to facilitating self-learning and fail to account for the overarching responsibility for patient clinical care. GP mentoring involves the development of a doctor-student relationship enabling the student to adopt the values and behaviours of a specific professional

rather than simply learn the trade. Although mentor relationships develop over time, prolonged contact between student and doctor is not enough to ensure mentorship.

> *Preceptor* is a practicing (sic) physician who gives personal instruction, training and supervision to a medical student or young physician.[1]

In Christian military orders a preceptor was in charge within a given geographical area. Musically, preceptor usually refers to a monk responsible for making music in the monastery. In some universities in USA, a preceptor refers to a student volunteer who takes some leadership within the student body to progress student learning. The word *preceptor* therefore recognises the dual themes of ensuring patient care and safety and facilitating student learning. These roles define a preceptor as a peer taking on a role to lead learning, while maintaining quality. This word captures the essence of a relationship with less power differential between doctor and student than is often represented in the traditional hospital model of clinical training.

1.4 The Parallel Rural Community Curriculum

It was against the background outlined above that the Parallel Rural Community Curriculum (PRCC) was developed, in the Riverland district of South Australia in 1997, as the first community-based longitudinal integrated clerkship program in Australia.[43] It was extended to the Greater Green Triangle in south-eastern South Australia and western Victoria in 2002.[44] In this full year program, medical students spend their penultimate academic year of a four year graduate-entry medical course based in rural general practice and small rural hospitals. The rural general practice setting is used to teach the basic foundations of medicine in all clinical disciplines

[1] Medical.merriam-webster.com

and is consolidated by students following patients and doctors through the hospital system.[36]

GPs who take a PRCC student into their practices commit to integrating the student within the practice including: providing a primary GP preceptor; a student study area within the practice; a weekly tutorial and two consulting sessions per week where a student has access to his/her own consulting room.

1.5 The parallel consulting model

In all practices involved in this study, both the student and the GP had their own consulting rooms. This enabled a booking system to be implemented where individual students consulted in parallel to their GP preceptors (Table 1.1).

Table 1.1 GP booking system for student precepting sessions using the parallel consulting model

Appointment time	GP consulting room	Student Consulting room
9am	Patient 1 *Parallel consultation*	Patient 2
9.15 am		GP joins student and Patient 2 *Precepting consultation*
9.30am	Patient 3	Patient 4

In this model two patients are booked at the first appointment time, rather than one at the first and one at the second appointment time. The GP sees a patient alone in parallel with the student who consults with a second patient in his/her own consulting room. When the GP finishes his/her initial consultation he/she then joins the student and second patient to conclude the precepting consultation.

In this study all doctors in the study ensured students actively participated in clinical practice by using the parallel consulting model. GP consultations were therefore categorized into three groups depending on the involvement of a medical student:

- 'solo' consultations - when a students was not present in the session
- 'precepting' consultations - when a student saw the patient prior to the doctor's involvement in the consultation
- 'parallel' consultations - when the doctor saw a patient on his/her own during a teaching session while a student was seeing another patient in a separate room.

1.6 Summary

Governments internationally have mobilised resources to develop rural training opportunities for medical students as a response to the rural medical workforce crisis. Flinders University has led the development of CBME programs in Australia through the Parallel Rural Community Curriculum. This program has demonstrated that the rural primary care context can provide students with equivalent academic results to their tertiary peers. Students have authentic roles in patient care across a broad range of medical conditions under the preceptorship of rural GPs.

The significance of the question, "How do GPs respond to the time impact of precepting medical students?" is demonstrated through the need to recruit and retain effective GP preceptors for sustainable CBME. This case study specifically seeks to answer this question within the context of the Parallel Rural Community Curriculum,

using the parallel consulting model.

2 LITERATURE REVIEW

2.1 Introduction

In this chapter the evidence regarding the time impact of precepting by rural general practitioners (GPs) and how this relates to other recognised impacts of precepting medical students is introduced. It then describes how previous researchers have organised these themes and examines the deficiencies in the theoretical perspectives used to date. This provides the background for defining the author's conceptual framework that informed the study design.

A review of the literature related to time impacts of precepting medical students on rural GPs was conducted. The search was extended to include all clinicians working in ambulatory settings because of the limited literature pertaining to rural general practitioners specifically.

The Medline, Ovid and ERIC e-databases were searched for original empirical and descriptive articles. Search terms included:

- medical student or undergraduate or graduate entry or medical teaching AND
- doctor or practitioner or clinician or physician or preceptor or mentor or supervisor AND
- general practice or family practice or family medicine or primary care or ambulatory setting or community setting.

The search was further broadened to include all articles fitting the above criteria found either in the reference list of previously reviewed articles, or through related articles.

This literature review focused on general practitioners (GPs); however data from paediatricians and general physicians are also presented. The term "family physician" is used interchangeably with "general practitioner" in the context of studies from Canada or USA. Studies from the UK use the term "general practitioner" similar to the Australian context.

As the nature of general practice has changed over time, only articles from 1984 to May 2004 were considered initially. This review was published in 2005 [45]. A subsequent review of the literature between 2004 and 2008 was performed and articles from both searches were included in this thesis.

Any articles involving the impact of medical students on doctors, which did not involve supervision in a clinical setting, were excluded. Articles voicing individual opinions of impacts on GPs, even if considered "expert", were excluded. This resulted in the exclusion of program descriptions where authors' references to impacts on GPs were not clearly based on empirical findings using quantitative or qualitative research methods.

In total, 44 articles studying preceptors in Australia, UK and USA were included in the final review, nine of which studied solely rural doctors (Appendix 1), twelve studied a mix of both urban and rural preceptors (Appendix 2), and the remaining 23 were solely urban studies (appendix 3). Of the articles found, four were literature reviews [33,46-48]and 40 were original research articles or reports. Twenty three of these articles related to GP preceptors solely and 29 related to preceptors involved in a specified type of student attachment or specific medical school program.

Literature review findings take account of the author's assessment of internal, external and construct validity, and the transferability of study findings to the Australian rural general practice context. These assessments are included in Appendices 1 to 3 and are discussed, where relevant, in the presentation of findings below.

2.2 Evidence of time

When compared with urban GPs, rural GPs in Australia work longer hours and see more patients per week.[31] They describe their workloads as being exceptionally heavy. Insufficient time in the clinic setting has been shown to place significant demands on Australian general practitioners, which directly affects occupational satisfaction.[49] GPs consistently report the single most significant pressure when supervising medical students is time management.[39,44,49-54]

2.2.1 Length of day

On reviewing the literature relating to changes in length of day when precepting (Table 2.1) there was only one solely rural study.[55]

Table 2.1 Difference in doctor's office hours when precepting a medical student in primary care settings

Author / Reference	Year	Practice Type*	Country of study	Student level	Attachment length	Methods	Change in time spent
Rural Studies							
Doyle & Patricoski [55]	1997	GP	USA	Year 3 of 4	-	physician recorded	73min/day longer
Mixed rural / urban studies							
Strasser et al [42]	1999	Key GP	Australia	all levels	-	survey / SSI	120min/day longer (20% no increase)
Levy et al [53]	1997	GP	USA	Year 3&4 of 4	3 weeks	survey	87% spent more time
Bell & Frey [54]	1998	GP	USA	-	-	survey	27min/day longer (40% no increase)
Baldor et al [56]	2001	M/P/GP	USA	all levels	-	Likert scale survey	60min/day longer (28% no increase)
Vinson & Paden[57]	1994	M	USA	Year 3&4 of 4 years	4 weeks	survey	46min/day longer (SD 32min)
Urban Studies							
Ricer et al[58]	1997	GP	USA	Year 3 of 4	17 days in 4 weeks	direct observation	Calculated 74min/day of teaching activities
Vinson et al[59]	1996	GP	USA	Year 4 of 4	4 weeks	direct observation	52min/day longer (95% CI 16 – 88min)
Usatine et al[60]	1997	efficient GP	USA	Year 3 of 4	-	direct observation	consultations 1.1 minute longer
Kirz & Larsen[61]	1986	M/P/GP	USA	Years1,2,3 &4	4-20 session/ mth 1.5 - 9mths	logs / surveys	44min/day longer (SD 16.4min)
Foley[62]	1996	mix	USA	Yr 1,2,3 of 4 years	3 years, 1-4 session/mth	surveys	strongly disagreed took too much time
McKee et al[63]	1998	mix	USA	Year 3 of 4	6 week	daily session evaluations	did not increase length of session
Denton & Durning[64]	2003	M	USA	Year 3 of 4	-	physician recorded	32min/session longer (95% CI 17 – 48min)

*GP indicates general practice or family medicine; M indicates general/internal medicine; P indicates paediatrics.

Source: Literature review 2008

Questionnaire results from mixed urban / rural studies described an average increase in doctors' hours while precepting medical students of between 27 to 120 minutes per day.[42,54,56,57] However, in these studies there were large variations in the reported extra time required to precept a student, with 20% - 40% of doctors in the studies reporting no increase in time.

In solely urban studies, results from direct observations studies, [59,61,64] physician recorded logs [61,64] and focus groups [41] demonstrated the difference in doctors' hours averaged 30 to 64 minutes per day when precepting medical students. This is somewhat shorter than reported in the rural study. One observation study recognised that not all the 74 minutes per day engaged in teaching activities contributed to additional office hours. [58] Estimated extra time included 34 minutes giving mini-lectures or testing the student's knowledge and 10 minutes listening to students present patients. It is likely that these activities duplicated in part the usual consulting activities of history taking and patient management.

The majority of the urban studies described were from the USA, so the differences between the rural and urban studies may result from differences in context of primary care practice between Australia and USA. The results may also be variable as a consequence of fee-for-service practitioners protecting productivity in favour of increased work hours;[40,53,58,65] and solo practitioners being more likely to report extra time.[42]

There is a clear difference in the estimates of work time shown in survey studies where mean time increase was estimated retrospectively as 46 to 120 minutes;[42,54,56,57] self reporting studies where mean time increase was 32 to 73

minutes;[55,61,63,64] and observed studies where mean time increase was 0 to 52 minutes.[57,66] This suggests the results of studies were affected by the study method. This is consistent with Nelson's 1975 finding that clinicians are unable to accurately recollect their own activities.[67]

Difficulties in comparing study results also arise as a direct result of differences in the definition of a clinician's working day. For example, one study defined the end of the day as "the exact time of whatever activity ended the clinic",[64] while another study included any additional work done overnight following the conclusion of the clinic.[59] The majority of studies failed to describe how the beginning and end of the work day were defined.

Another study suggested clinicians did not lengthen their days as a response to precepting students.[63] In this study based in community health centres providing health care for low income patients, ten family physicians did not report increases in length of sessions. The small response rate (25%) to the daily survey suggests this group may not have been representative of the GPs in the organisation. McKee's study also described the average patient productivity in this setting was 2.8 patients per hour, well below the private family physician average of 3.3 reported in Vinson's 1996 study.[59] Obviously, doctors may alter patient productivity in order to avoid increasing their work hours, and this possibility was considered when reviewing the literature relating to time.

2.2.2 Productivity

Adams and Elsenberg showed in their literature review that the concept of clinician

time is intertwined with clinician productivity. [46] 'Productivity' includes the concepts of 'number of patients seen', and 'doctors' billings' in a fee for service setting such as Australian general practice. The term 'billings' is used in the literature to describe doctors' income derived from the collective fees charged to patients. About half rural preceptors (51.6% of 176 GPs) believed student attachments had a negative effect on their billings [38], and 40% agreed that precepting students increased practice costs. Some physicians in rural private practice found this cost prohibitive and were significantly less likely to agree to precepting a student. [56] This was more likely where practices were also responsible for student accommodation and learning resource costs.

In the USA, family physicians who taught students did not vary from non-teachers in terms of volume of patients seen or the ratio of subsidised patients to full fee paying patients; however their patient demographics differed as family physicians who taught medical students saw more patients for obstetrics and gynaecological examinations than non-teachers. This difference was independent of physician gender. [40] There is no evidence as to whether this correlation exists in rural Australia.

Studies measuring patient numbers and billing charges were evaluated against their findings related to length of day (Table 2.2). Most Australian GPs described a reduction of 6-10 patients per day or 1-2 patients per hour when precepting.[42] This differed considerably from the only USA rural study where primary care clinicians from paediatrics, general medicine and family practice reported no significant change in patient numbers. [68] Mixed and urban studies, all from the USA, produced a range of zero to five patients fewer patients per day.[42,58,59,61,63,69-71]

Table 2.2 Difference in patient numbers and billed charges when precepting a medical student in primary care settings

Author / Reference	Year	Practice Type*	Methods	Change in time spent	Changes in patients seen per day	Change in billed charges
Rural studies						
Doyle & Patricoski[55]	1997	GP	physician recorded	73min/day longer	2.2 fewer per day	-
Barritt et al[38]	1997	GP	surveys	-	-	52% reported decrease
Fields et al[65]	1994	M/P/GP	surveys	-	not sig	not sig
Mixed studies						
Strasser et al[42]	1999	GP	surveys / SSI	120min/day longer	6 – 10 fewer per day	-
Levy et al[53]	1997	GP	surveys	87% spent more time	31% saw fewer patients	25% lost practice income
Baldor et al[56]	2001	M/P/GP	Likert scale	60min/day longer	73% agreed decrease	
Vinson & Paden[57]	1994	M	surveys	46min/day longer		not sig
Urban studies						
Ricer et al[58]	1997	GP	direct observation	Calculated 74min/day extra activities	not sig	
Vinson et al[59]	1996	Private GP	direct observation	52min/day longer	0.3 fewer per hour	-
Kirz & Larsen[61]	1986	M/P/GP	logs / surveys	44min/day longer	2.2 fewer per day	-
McKee et al[63]	1998	mix	daily session evaluations	no increase	no decrease	-
Garg et al[72]	1991	M/P/GP	records / estimates	-	-	30 - 40% lower
Kearl & Mainous[70]	1993	GP	billing records	-	not sig	not sig
Grayson et al[71]	1998	M/P/GP	surveys	-	62% reported decrease	-
Gray et al[73]	2001	GP	Practice records	-	patient list smaller	Lower patient related income
Shesser et al[69]	1985	E	estimated by Dept	-	not sig	-

*GP indicates general practice or family medicine; GM indicates general medicine; P indicates paediatrics

Source: Literature review 2008

Few studies have focussed on doctors' billings in the ambulatory care setting. No quantitative studies from Australia were found, although 52% of rural doctors reported a decrease in billings when precepting a student. Three studies found the change in billed charges were not significant.[57,68,70] Only one study [72] reported a dramatic reduction in billings, while another found patient related billing was lower and this was not fully compensated for by teaching payments. [73] This study is not helpful when considering the impact of students on rural GPs, as it compared the annual earnings of faculty staff in three US community health centres employed to work in teaching clinics for 29 hours per week.

Combining the studies on patient numbers and billed charges results in an overall picture of practitioner productivity. Five studies found doctors experienced longer days, in addition to reducing their productivity, when precepting medical students.[42,55,56,59,61] This may indicate that reduction in number of patients seen is due to students disrupting patient flow, rather than as a conscious attempt to contain office hours.[56] There are studies which demonstrate evidence of protecting productivity in favour of increased work hours.[53,57,58,65] No judgement can be made of the remaining studies listed in Table 2.3. These findings suggest that the relationship between work hours and productivity are not as simplistic as a direct trade-off, and that other variables need to be taken into account.

When assessing the impact of students on preceptors' time and productivity, many authors have failed to make explicit the involvement of the preceptor in the medical student program, making comparisons between studies difficult. Strasser, however, described that averages of reported "reduced patients seen" and "increased hours worked" were highly sensitive to the duration of placements.[42] Vinson confirmed

that students in Year 3 of 4 were perceived to take more time and impact on productivity more than Year 4 students.[40] Ferenchick, Chamberlain et al proposed that precepting time was related to the level of the learner and whether they were engaged in block or integrated attachments.[47] Adams recognised that a small group of doctors increased their billings when precepting students, and proposed that this occurred in established teaching practices, inferring precepting efficiency develops over time.[46] All these propositions suggest that time and productivity may be related to differences in the way clinicians manage the consultation process when a student is present.

2.2.3 Consultation time and activities

Four studies measured changes in the length of patient consultations rather than the length of general practitioners' days (Table 2.3). Only Worley and Kitto's study showed a statistically significant difference between reported consultation length with and without a student, where reported mean consultation length reduced from 14 minutes 24 seconds to 9 minutes 30 seconds ($p = 0.001$).[74] External validity of the study was questionable, as only 91 of the total 938 self-reported consultations involved students. There is a risk to population validity, as this sample of 91 consultations may possess unique qualities which are not representative of the diversity of precepting consultations. Importantly, construct validity of this study is debatable, as the reported reduction in consultation length found from GP logs was not confirmed by the observation arm of the study.

Table 2.3 Study findings regarding consultation times

Author / Reference	Year	Practice Type*	Country of study	Student level	Attach-ment length	Methods	Change in consultation length
Rural studies							
Worley & Kitto[74]	2001	GP	Australia	Yr 3 of 4 years	1 year	logs / direct observ-ation	Precepting consultations 4 minutes shorter
Mixed rural / urban studies							
Frank et al[66]	1997	Ambulatory care	USA	-	-	direct observ-ation	no sig difference
Urban studies							
Usatine[60]	1997	Family medicine	USA	Year 3 of 4	-	direct observ-ation	no sig difference
Usatine	2000	Family medicine	USA	Year 3 of 4	-	direct observ-ation	no sig difference
Source: Literature Review 2008							

The study by Frank and the two papers by Usatine, using the same data set did not show a significant difference in consultation times when precepting a student (Table 2.4). The power of the studies by Usatine were poor with only four exemplary preceptors observed for less than 50 consultations.[60,75] Frank's study[66] may not be helpful in the Australian context, as it was usual practice in this USA academic clinical setting for paperwork to be completed away from the patient. This time was therefore not included in the assessment of consultation time.

Frank's time and motion study[66] measuring changes in consulting activities showed that when a student was present, the individual doctor spent: a greater percentage of time structuring patient interviews; less time on history-taking; the same percentage of time examining patients; less time informing patients about the assessment; and no

difference in the percentage of time planning and arranging treatment. Findings in Worley and Kitto's study[74] did not concur, with increased time spent on history-taking and no difference found in time spent discussing with patients and family. There was also an addition of one minute of teaching time per consultation and a possible reduction in paperwork activities. No significant differences were found in Usatine's studies, despite the four exemplary preceptor subjects reporting increased productivity when working with students.[60,75] Further studies are required to understand how GPs' consulting is affected by precepting medical students in the Australian rural setting.

Table 2.4 Clinicians' consultation activities with and without students

Study	Frank 1997[66]		Usatine 1997[60]		Usatine 2000[75]		Worley & Kitto 2001[74]	
Student present	‡ yes	‡ no	yes	no	yes	no	‡ yes	‡ no
No. of timed consultations	83	369	33	14	30	14	28	37
Total preceptor time	10.3†	9.9†	11.7	10.6	16.2	15.3	9.5†	14.4†
Difference in clinician consultation time	p=<0.6		no sig diff		no sig diff		p<0.001	
Review of case notes prior to seeing patient			n/r	n/r	0.4	0.2	0.69	0.49*
history taking	4.72	5.25*		None	2.2	None	1.77	1.61*
planning treatment	3.20	3.24						
physical examination	2.24	2.08	7.9		8.8	8.9		
health education	1.76	1.91						
pt feedback post-exam	1.25	1.5*			1.6	1.9	3.03	3.03
structuring interview	1.05	0.79*						
family information	0.80	0.83						
Chatting	0.64	0.76						
answering questions	0.53	0.67*						
Procedures	0.56	0.32						
student presentation			2.2					
Teaching			1.8		1.6	None	<0.95	None*
consult research time					0.9	0.3		
charting / paperwork	n/r	n/r	n/r	n/r	0.7	4	1.06	0.97*

‡mins/per consult calculated by multiplying % by length of consultation
† total may be less than sum of activities as behaviours not mutually exclusive
*statistically significant differences calculated from activities as % of total consultation time
n/r not relevant
Source: Literature Review 2008

Clinicians could alter both their patient-centred consulting activities, and their student-centred teaching activities in response to the time pressure they experienced. When choosing patients for students to attend, clinicians reported considering three competing pressures: time and efficiency, educational value and the doctor-patient relationship.[76] Clinicians reported less confidence in their teaching skills than their consulting skills, and this may have resulted in students being more likely to observe passively when working with time pressured preceptors.[40] Interestingly, McKee, Steiner- Grossman et al[63] found that productivity and overtime were not related to the students' assessment of quality of learning. The perceived quality of the student learning experience has, however, rarely been considered as a significant variable in studies of the time / productivity impact on GP preceptors.

2.2.4 Time and Stress

The most significant stressor on GPs when supervising medical students is feeling they have insufficient time.[39,44,49-54] This is concerning as insufficient time in the clinical setting has already been shown to directly affect GP occupational satisfaction.[49] These findings are consistent with the organisational psychology literature which recognises that job performance and job satisfaction are linked to each other and moderately correlated to job stress, particularly role stress.[77,78] Role stress is affected by both the experience of competing demands within the workplace (role conflict) and the extent to which an individual is unclear of their responsibilities (role ambiguity).[78]

Despite the time pressures described, 87% of rural general practitioners in South Australia reported precepting a student in 1996.[38] The majority of doctors disagreed

that precepting took too much time.[62] This indicates that the rewards of teaching must be considered as well as the time impact when considering why GPs choose to precept.

2.3 The broader impacts of precepting

The proportion of doctors who reported increased enjoyment when precepting has always been high.[79-81] In studies that asked doctors to think of impacts for themselves there was a recurring theme that enjoyment increased while supervising medical students.[49,52,81] This finding was supported by Chambers and Campbell's study which found that there was a higher prevalence of depression and anxiety in GPs working in non-training practices.[82] A sense of the enjoyment student precepting can create is expressed by Anandarajah in the quote below.

> For me, giving compassion, understanding, time and patience to patients is a way of giving spiritual care…I find I need inspiration and motivation to make the effort…One of the places I find this inspiration is working with medical students and residents. They inspire me with their idealism, compassion and enthusiasm; I give them the benefit of my life experience. It's a pretty good deal. I think I'll continue to do this for a long time.[83] (Page 20)

2.3.1 Personal

In the general literature, GPs have described an increase in the enjoyment of practising medicine when precepting, with a sense of increased value in their work.[39,41,51-53,56,57,61,62,71,79,84-86] GP's described the enjoyment they gain from positive student responses as the most explicit factor in tutor recruitment and retention.[39,42,51,60,84,87,88] Student responses that had a positive impact on teaching included motivation, enthusiasm and positive feedback.[51,88] GPs enjoyed seeing skill

development, and team and patient support of students.[88] Sources of enjoyment were less explicitly defined in the rural literature compared with urban-based studies. [89]

Nearly half of all primary care physicians (in a study from the USA[56]) found precepting a student in their own practice increased their stress. However, rural GPs were less likely to think that precepting students increased their overall stress level when compared with their urban colleagues.[56] Rutter and Herzberg concluded from their literature review, that some components of teaching may mitigate stress as involvement in medical education was inversely related to depression and anxiety scores.[48] They proposed that this was related to the job enrichment, peer recognition and professional status created by clinical teaching.

Doctors were negatively affected by problematic interactions with students, programs or program personnel.[41] Although GP preceptors rarely had problematic students, the impact on these occasions was significant. Reported problems included: practical difficulties, negative feedback, conflicting cultures and poor student fit with tutor or team expectations.[88] A difficult or uninterested student could bring about self-doubt and team disappointment. It was reported that females and novice GP tutors may well be more affected by student reactions and therefore may be more vulnerable.[88] Interestingly, no studies have described GPs reporting stress associated with feeling more accountable because of student scrutiny and questioning.

GPs commencing precepting initially described anxiety regarding their teaching capacity.[44] Despite this, many GPs were motivated to teach because they perceived opportunities to increase their own learning and development.[38,56,61,62,71,84,86,90] Once actively involved in medical student supervision, the majority of preceptors

described themselves as staying more current with medical literature,[39,41,71] and found developing their teaching skills an important reward.[39] Preceptors described feeling confident when precepting students,[89] and the confidence generated among rural preceptors by teaching improved their morale[81] and self esteem.[39,52] This resulted in a positive feedback loop where these GPs then increased their support for the rural teaching programme.[81] This cycle of satisfaction for community based teaching was recognised by Howe, who described that a motivated confident teacher with a good team and a responsive student enhanced professional self image, and increased the likelihood of a longer term commitment to the provision of teaching.[88]

2.3.2 Growth in others / replication of self

Many preceptors described feeling satisfaction for being an important part of the training of the next generation,[62,86] and being seen by the students as a role model.[88] Clinicians felt satisfaction related to paying back the profession.[41,62,86]
International studies have suggested that this motivation may be even more prevalent amongst general practitioners when compared with specialists, with 58% being motivated to precept because it would attract medical students to their discipline.[62,86] When it came to attracting medical students to their communities this was a motivating factor for only 18% of GPs.[84]

The reasons given by 13% of Australian rural general practitioners for teaching included an aim to promote rural practice.[42,86] A few ambulatory care physicians in USA indicated that precepting could help them recruit future partners to their practices,[57] and help recruiting new practitioners to the community was valued highest after direct financial and material supports.[91]

2.3.3 Patient care

GPs almost universally stated that patients remained their primary responsibility, but medical students' needs were viewed as compatible with this responsibility.[92] Studies concluded that a majority of preceptors felt precepting improved the quality of their practice.[56,61,84,88] They believed that having students did not make patients feel uncomfortable or interfere with the doctor – patient relationship.[56,61] Preceptors frequently described that they had gained new, useful information from students.[51,93] Many preceptors reported that they received positive feedback from patients about their interaction with students.[41,51] Typical positive responses implied that patients received more personal attention from the students. Students spent more time with patients and asked more questions of them.[61]

Importantly, a small but significant group of GPs had concerns that teaching might have an adverse effect on their patient care.[39,52,61,71] This was of particular concern to part-time GPs (often women) who felt students may interfere with their relationship with patients and they would have little time left to see patients alone.[56] Some preceptors selected patients for students to see based, in part, on the anticipated effect on the doctor-patient relationship.[76] These findings indicate that poor patient satisfaction is a small but significant risk which GP preceptors work to avoid.

2.3.4 Professional Relationships

Key preceptors have described increased interaction with medical schools and increased identification with peers who also saw themselves as teachers.[41,94,95] This reduced professional isolation of GPs and resulted in increased professional pride in relation to their roles as a preceptors.[81] Some GPs reported an increase in patients'

perceptions of their status.[71] A small group of GPs described increased recognition in the community as an appropriate reward for teaching students.[88] Many preceptors describe wanting to train the next generation and be seen by the students as role models. They described a desire to pay back the profession.[62] No data were available regarding rural GPs specifically.

2.3.5 Practice business and infrastructure

Having space to accommodate students was a significant issue for many rural practices particularly as they were already reported to be overcrowded.[44,52] In an Australian study 55% of practices had a room available for students to consult on an ongoing basis and 26% on an intermittent basis.[42] There was also concern regarding lack of access to study facilities, important reading material, and internet access for student learning.[87] Organisational and administrative support was valued by GPs.[52]

2.3.6 Recognition and remuneration

In an Australian study, the majority of rural GP preceptors agreed that there should be financial remuneration for precepting medical students in their private practices.[42] Significant numbers of GPs who have been paid have argued that they received inadequate remuneration.[39] In the past, preceptors have stated that lack of funds would not change their commitment to teaching.[87] However, more recently increasing pressures from clinical responsibilities have began to change this.[94] Other authors have found that "dollars alone were not helpful"[91] and recognition by the University of the work that rural GPs were doing under difficult circumstances was just as important.[49]

2.3.7 Summary of impacts

The broad range of variables described above summarises the impact of medical students on general practitioner and other clinician preceptors. Many of these studies have attempted to order a somewhat eclectic collection of impacts by weighting their relative frequency or attributing relative importance. This creates a 'shopping list' impression of the effects of precepting which is unhelpful in understanding how these variables relate to time and why clinicians commit to or continue precepting.

Further analysis of the literature was performed in an attempt to uncover current theoretical models used to understand the impact of precepting on clinicians.

2.4 Conceptual framework

> Frameworks are not blinders or strait-jackets; they emerge from experience, they are revised and corrected through research, and refocussed to serve the needs of the study.[96] (Page 106)

When considering studies regarding the impacts of precepting on clinicians, organisational theories provide an analytical basis for evaluating the assumptions made by researchers. Many studies divided impacts into positive and negative mutually exclusive subsets, inferring that gains and rewards are weighed against costs and challenges when GPs choose to precept. These studies fail to recognise that the same impact can be interpreted quite differently by GP preceptors.[2,33,38,56,86,88]

The conceptual framework for this study was influenced by Maslow's[1] hierarchy of needs (Figure 2.1). In this model, basic needs such as safety and physiological needs were differentiated from other needs, as stress ensued if deficiencies occurred in

these elements. Negative impacts such as time pressure and patient safety are perhaps more appropriately seen as equivalent to basic needs in this model. On the other hand, positive impacts such as seeing students learn could correspond to higher order needs described in Maslow's model. These created pleasure with their fulfilment.

In the hierarchy of needs Maslow (1954) assumed the need to meet the lower order needs before an individual was empowered to meet higher order needs. This theoretical concept influenced the author to consider whether there were basic needs or more urgent drivers affecting the motivation of GPs to precept. Certainly the literature seemed to identify some impacts such as time pressure more frequently, or more fervently, suggesting these may be more basic.

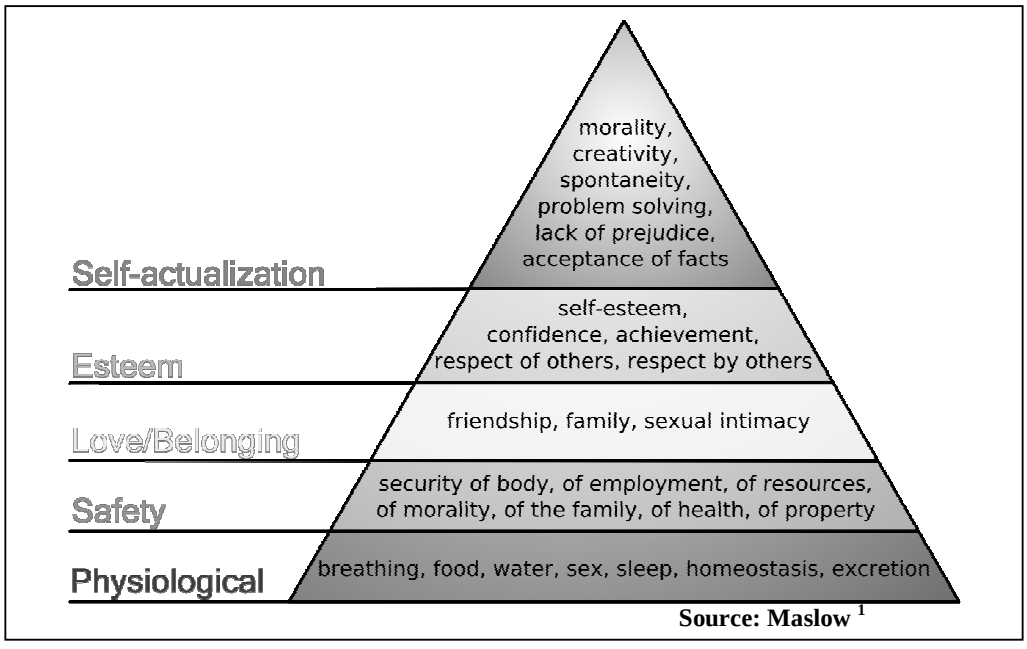

Figure 2.1 Maslow's hierarchy of needs

In reviewing the more recent literature, many personal motivation theories have been conceptualised[97,98] with little variable concordance, perhaps indicating the different philosophical perspective of researchers rather than difference among groups of people.[99] It therefore seems reasonable to ask GPs how their needs could be met.

Howe further divided the GP perception of the impacts of precepting into preceptor, practice and student factors.[88] Other researchers have categorised subjective impacts into firstly, affective / emotional / intrinsic; secondly, cognitive / intellectual / secondary; and finally, tangible.[2,41,52,100] Although these thematic categories are somewhat helpful, the authors again assumed that clinicians can be encouraged to increase the quantity and quality of precepting by increasing rewards or reducing hardships. This perspective is consistent with Organisational Development Theory (Table 2.5) that assumes overlap between individual and organisational goals will trigger individuals to change behaviour, for example, to commence precepting.

Table 2.5 Organisational change theories: differences and similarities across six dimensions

	Systems	**Organisational development**	**Complexity**	**Social Worlds**
	Goals	**People**	**Evolution**	**Conflict**
Metaphor of organisation	General practices can have organisational inertia. Change is infrequent, discontinuous and intentional		General practices are emergent and self organising, and change is constant; evolving and cumulative	
Analytical framework	Change takes place at the level of a single organisation		Change takes place where the organisation interacts with another organisation or with its environment	
Trigger for change	Clear goals, measurement and feedback loops	Overlap between individual and organisational goals	Desire to try multiple approaches and let direction arise gradually over time	Difference in opinion
Change process	Change as goal achievement	Changing behaviour firstly involves breaking down attitudes	Change is Confucian: already underway, without end	Change as conflict followed by synthesis into new order
Role of leader	To establish a measurement and feedback process	To encourage participation	To interpret emerging change with team	To take a strategic view of multiple agendas
Resistance to change	Due to data poverty and lack of clear goals	When individual and organisational goals differ	As one stage in the sense making process	As a natural part of a conflict process

Source: Rhydderch, Elwyn et al. 2003[101]

From the perspective of Organisational Development Theory, change can therefore be affected by Lewin's three step model similar to freezing and refreezing an iceblock.[101] This involves: breaking down attitudes and behaviours; a transition time where practitioners adopt new ways of doing things; and then establishment of new routines.[102] This theory emphasises the role of people as drivers of organisational change. Although the majority of studies looking at the impact of precepting on clinicians have failed to define a theoretical perspective, they have implicitly adopted an organisational development perspective, as this was useful for academic leaders intent on expanding medical student attachments in primary care. The weaknesses in

this approach include a simplistic view of general practice, isolated from the external pressures of the context, and an assumption that alteration of a single variable can create predictable change.

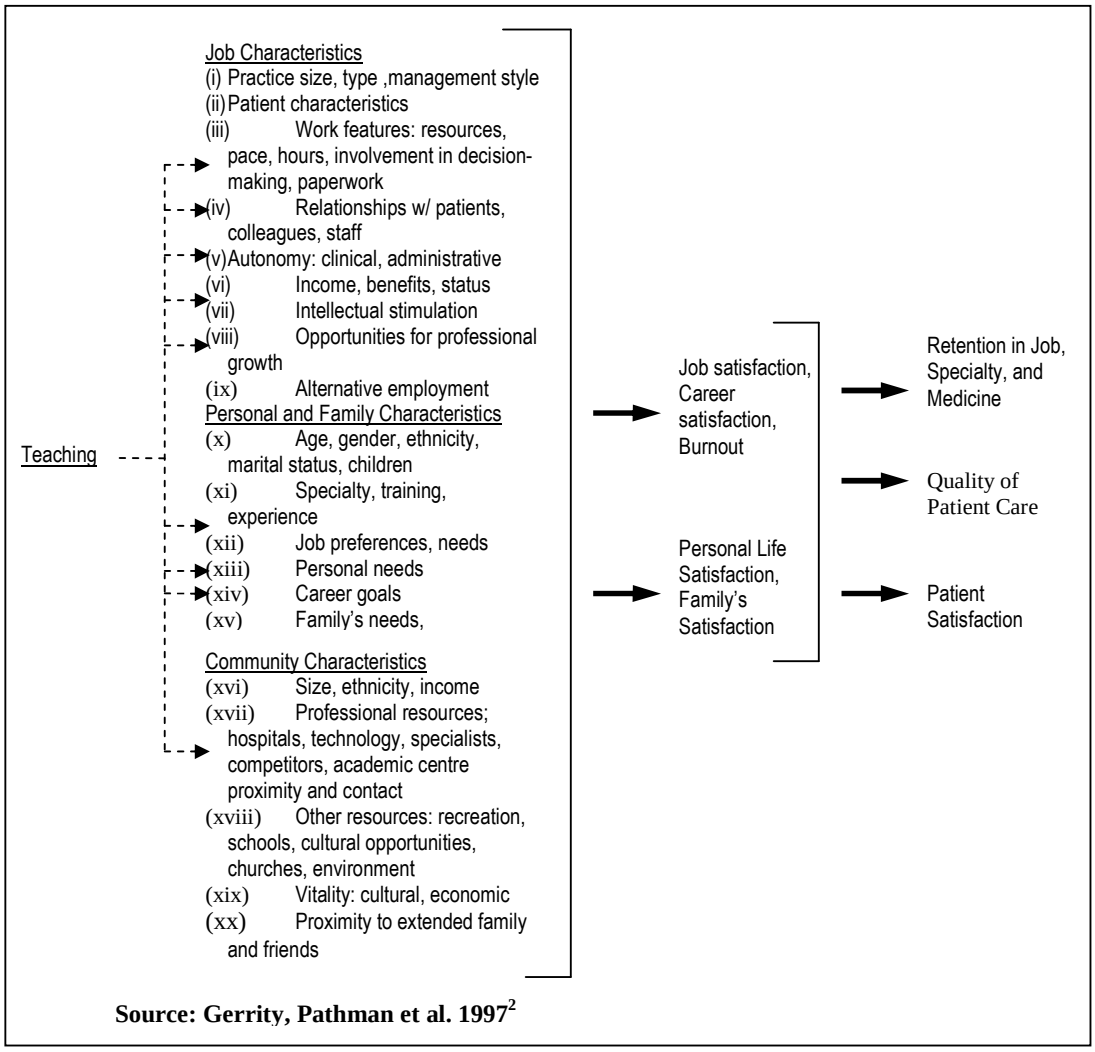

Figure 2.2 A conceptual framework of the impact of teaching on physician's job and career satisfaction

Gerrity, Pathman et al.[2] progressed their thinking on how teaching affected a conceptual model of career satisfaction (Figure 2.2). This study worked from a perspective that factors affecting general practitioners and their environments are

infinite, interconnected and constantly changing. In this study general practice is seen as an open complex adaptive system consistent with complexity theory (Table 2.5).

> Given a significant degree of complexity in a particular environment (or 'dynamical system'), new properties and behaviours, which are not necessarily contained in the essence of the constituent elements or able to be predicted from a knowledge of initial conditions, will emerge. The focus thus shifts from a concern with decontextualised and universalised essence to contextualised and contingent complex wholes.[103] (Page 35).

This study was unique in the literature reviewed, highlighting that studies on the impact of precepting students on general practitioners have mostly failed to recognise the interconnected nature of factors. To date there is no model which clearly explains how and why general practitioners commit time to precepting over competing activities in this dynamic environment.

The intention of this study is therefore to understand the lived experience of precepting by GPs in the GGT PRCC program. The rudimentary conceptual framework, developed from the literature, recognised the influences on GPs work were infinite, interconnected and constantly changing (Figure 2.3). Importantly, it makes explicit the researcher's ideas of the components of the phenomenon of medical student precepting by GPs which are not well understood. The commitment to a preliminary conceptual framework is supported by Miles and Huberman, as it makes explicit the preconceptions of the researcher and informed the development of the methods as discussed in Chapter Three .[104]

The rudimentary conceptual framework (Figure 2.3) proposes that precepting increased time somewhat as a consequence of responding to motivators. However, time increase was limited by activity changes which were driven by the preceptors' drives to fulfil 'basic needs' within the context of rural general practice.

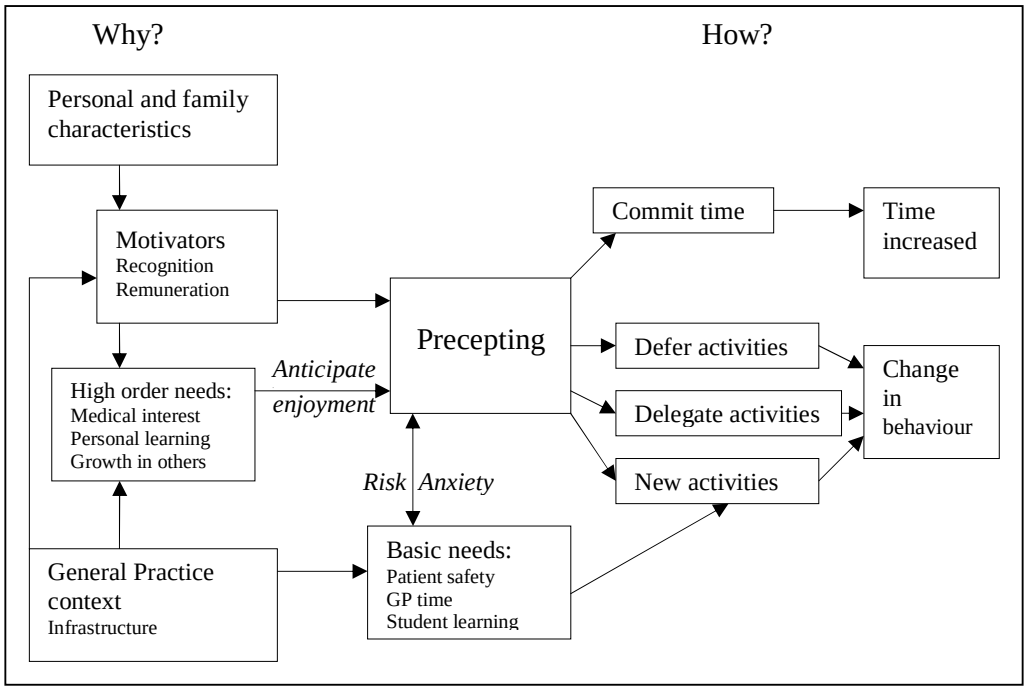

Figure 2.3 Preliminary conceptual framework regarding how and why GPs commit time to precepting

2.5 Summary

Many studies have looked at defining the time impact of precepting students; however few studies have: objective, reliable and valid data regarding consultation time or physician productivity; clearly defined student precepting methods; taken into account the rural practice context; or provided a theoretical framework to account for how or why GPs commit time to precepting.

Some previous studies suggested that supervising students may increase the length of GPs' working days by up to two hours. At a time of medical workforce shortage,[5] this increased time commitment may be unsustainable. There have been studies which demonstrated that precepting a medical student does not increase GP

consultation time, however, these studies have not accounted for non-consulting time in a GP's working day. There has been little research to clearly define the skills and activities required to ensure time efficient and effective precepting. These issues represent serious gaps in the knowledge required for the recruitment and retention of motivated rural GP preceptors.

The conceptual frameworks implicit in the majority of studies have a simplistic view of general practice isolated from the external pressures of the context, and assume that alteration of a single variable can create predictable change. This does not account for general practice as an open complex-adaptive system. There is inadequate theoretically driven evidence to address the question "How do general practitioners respond to the time impact of precepting medical students?" within the context of Australian rural general practice. A preliminary conceptual framework, based on the evidence from the literature, informed the research design for this study.

3 RESEARCH DESIGN

3.1 Introduction

In this chapter an historical account of the dominant epistemology in medicine and medical education is presented. The theoretical perspective used to inform the methodology is discussed before introducing the grounded theory approach and describing how this is used in a mixed method case study to determine how and why rural GPs commit the time to precept medical students. The quantitative methods used to measure consultation time and activity outcomes are then described and the rigour of these methods examined. Finally, qualitative methods used to answer the process questions are presented and their rigour discussed. This information demonstrates that the methods used in the study enable a valid and reliable answer to the research question.

3.2 Theoretical perspectives

The theory and practice of medicine have been dominated by the bio-reductionist model of medical science and its accompanying positivist theoretical perspective. The ontology of positivism is realism. The epistemology of positivism is objectivism with the researcher taking the role of independent third party. Knowledge is seen to be like gold, an inert and precious substance which can be discovered if the researcher looks in the right place. [105]

The history of positivism in medicine can be traced back to Hippocrates and his successors whose focus on the mechanistic aspects of illness gave rise to the notion that diseases have specific causes.[106] The subsequent reductive methodology has

been remarkably successful in developing an understanding of the elements of disease: the study of anatomy by Michelangelo and Da Vinci in the Renaissance[107]; Harvey's understanding of the circulatory system and the heart's pump-like action in the 17th Century[108]; the development and progress of the germ theory of disease by Semmelweis, Pasteur, and Koch in the 19th Century[109]; and more recently the role of the electron microscope in identifying the internal architecture of viral particles. The consequence of this positivist reductionist epistemology however has been to fragment knowledge in an attempt to discover the "ultimate and unchanging foundations".[110]

> Medical knowledge of the nature of the human body and its workings was thus a matter of a progressive revelation of the nature of its fundamental parts and their contribution to the whole.[110] (Page 33).

Objectivism assumes investigation of a subject can occur without influencing or being influenced by it.[105] The strength of this epistemological influence on medicine is demonstrated by the emphasis on randomised control trials in Evidence Based Medicine. It is a paradox that this positivist view of knowledge is in stark contrast to the way clinicians collect information and apply clinical reasoning to individual patients. The experienced clinician understands that an individual's interpretation and commentary of his/her illness does not necessarily fit rigidly with the standard pattern of disease.[111]

This reasoning process has often been described as the "art" of medicine in contrast to the "science" of the positivist theoretical framework. Alternatively, this reasoning represents clinicians' understanding that individuals experience the reality of their illnesses differently; that meanings, and consequent diagnoses, can be created through two-way processes of enquiry between clinicians and patients. This

theoretical perspective is constructivism. The ontology of constructivism is relativism.[105] Reality is seen as subjective and created from the relationship between researcher and the subject of study. As Kvale notes

> Knowledge neither exists inside a person nor outside in the world, but exists in the relationship between person and world.[112] (Page 44).

Research studies which have a constructivist theoretical perspective are now being used in the field of medicine.[113-115] Medical education has been influenced by the constructionist perspective more convincingly through its close association with educational researchers, who have in recent years favoured quasi-experiments and qualitative studies.[116] Torgerson summaries

> Medical education research is under the influence of two research communities each of which is heavily influenced by opposing research paradigms.[117] (Page 1003).

In this study, the field of rural community-based medical education has no recognised disciplinary norms; however, rural health researchers have historically argued that context is important in the understanding of medical practice in their field.[118] Observations of clinical practice influenced an understanding of "truth" as the outcome of an interaction between two or more parties. It is therefore fluid and may change over time or between groups. If two different groups work to define the "truth" about medical students' impact on GPs, the outcomes from these interactions may be different because of differences in the context of the interactions, and the lenses they bring to examine the question. However, they are equally valid "truths" which, when combined, create a more informed understanding of the overall situation.[105]

In line with this symbolic interactionist perspective, a grounded theory approach was chosen for this study.[119] This methodology aims to use inductive synthesis of both qualitative and quantitative data sets through theoretical sampling and constant comparison to create analytic generalisations.[120] These generalisations can then be used to critically appraise the initial conceptual framework and construct a theoretical model to explain how and why GPs committed time to precepting[104].

Just as clinical medicine has gained from utilising both the interpretive clinical skills of the clinician and the objective biochemical tests in the diagnosis and management of patients, Prideaux[121] and Creswell[122] have affirmed the value of a multifaceted approach to research methodologies in examining medical education. Using mixed qualitative and quantitative methods in a grounded theory approach can increase the understanding of the cases studied.

> …wherein the original intent was to triangulate findings, to demonstrate convergence in results. More recently, authors have broadened the purposes for mixing methods to include an examination of overlapping and different facets, to use the methods sequentially, to find contradictions and new perspectives, and to add scope and breadth to a study.[122] (Page 189).

Patton highlights the importance of determining the appropriate method, whether qualitative or quantitative or both, by looking carefully at the questions to be answered, in preference to the more limited, orthodox application of a single method.[123]

Individuals attempt to make sense of their own lives and their own culture, so meaning is not only present at an aggregate level, but on a case-by-case, environment-by-environment basis. Medical student supervision occurs within the culture of rural general practice. An interpretive theoretical perspective can focus on precise descriptions of a rural GP's view of their experience of precepting. Cases

where GPs supervise medical student set in the culture of rural general practice, are ideally suited to the application of case study methodology. Case study research has traditional roots in both sociological and medical case reporting and involves in-depth analysis of a 'bounded system' (a program, event, activity or process).[124,125]

The real-life context of parallel consulting with students from a longitudinal integrated community curriculum is contemporary and internationally relevant. It is unclear to what extent the specific contexts of Australian general practice, rural practice, the Parallel Rural Community Curriculum program, graduate-entry medical students or the Greater Green Triangle environment itself, influenced the GPs' perspective.

In this study the case characteristics are defined as an individual PRCC GP's experience of time commitment when precepting a medical student in a general practice setting (Table 3.1).

Table 3.1 Case characteristics in the study

Case study method requirements **Source: Yin 1989[126]**	This study
Specific group of individuals	PRCC GP preceptors
Experience	Time commitment
Specific social setting/activity	Precepting using the parallel consulting model
Specific physical setting	In Australian rural general practice

An important feature of case study method is the use of multiple data collection tools and data sources to gain insight into the study phenomenon, and enable comparisons

to be made within the data.[126] A multiple site case study facilitates this requirement well, enabling not only comparisons between the multiple sources of data collected within each case, but also comparisons between the cases themselves.[124]

This case study was therefore developed in two parts. The first part measured the quantitative component of the research questions with a view to testing the following theoretical propositions: precepting takes more time than consulting alone; consultation activities change when precepting, due to the additional role of teaching a medical student; and non-consulting activities change when precepting a medical student. By statistical analysis of the time measurements of videotaped consultations, it would be possible to determine the time taken to precept. By recording the frequency of formally categorised GP activities, it would be possible to quantify changes in GPs' work day activities. This component of the case study, described in more detail below, answered the research questions:

- What is the time impact of precepting medical students?
- What is the impact of precepting on GP activities?

The second part of the study sought to understand what precepting was like in the PRCC program within the environment of rural practice. Interview data were collected from GP preceptors practice managers and medical students. These data were compared with GPs from other contexts, and the videotaped data analysed by the researcher. The questions posed included:

- How do rural GPs perceive the time committed to precepting?
- How do GPs see the experience of precepting a medical student?
- Why is the precepting experience meaningful for GPs?

This component of the case study, described in more detail below, was triangulated with the quantitative data in order to create analytic generalisations, to critically appraise the initial conceptual framework, and construct a theoretical model to explain how and why GPs committed time to precepting.[104]

3.3 Ethics

The Australian National statement on ethical conduct in human research states the following themes must inform research: integrity, respect of persons, justice and beneficence [127].

Integrity refers to the state of being whole, undivided or sound, or a steadfast adherence to a strict code of practice. Ethics approval was sought for this project in its entirety. The research proposal gained ethics approval from the Flinders University Social and Behavioural Research Ethics Committee (Project number 2872).

All components of this research project were conducted with a firm intent to respect patients, students, GPs and other members of the clinics involved in or affected by the study. This included the intent to fairly capture and truly reflect the perspectives of all parties while maintaining confidentiality and ensuring no harm was done to any party. The folllowing sections outline the major issues affecting each group of participants, and how these were addressed.

3.3.1 Patients

Patients were only involved in the videotaped component of this study. The major issues which patient participants required addressing in this study were consent and confidentiality. During sessions being videotaped, patients who would be potentially involved in the study were approached personally by the research assistant and informed that the doctor they were seeing today was participating in a videotape study seeking to understand his/her activities during consulting. All patients were asked if they would be happy to participate in the study, and were reassured that should they choose not to be involved in the study they would not be disadvantaged when consulting the doctor today or in the future.

In relation to confidentiality, it was explained that there was a videocamera on the desk in the consulting room they were going to enter. This videocamera was positioned facing the person sitting at the desk, in an attempt to keep the patient out of camera. Patients were informed that videotapes would be stored in a locked cabinet, and would only be accessed by the research team involved in this study unless they signed the release to allow use for other research. All coded data from the videotapes were deidentified.

3.3.2 Doctors and practice staff

Doctors and practice staff were potentially affected by this research either by participating directly, or collaterally by unintended logistics related to the videotaping occuring in a busy work environment.

In order to minimize the impact of videotaping consultations and direct observation of doctors in the general practice clinic, the researcher and research assistant

managed all the videocamera set up prior to the commencement of the session. During the consulting session, patient consent and managing the videocamera were again managed directly in an attempt to avoid practice staff having to alter their daily routine. Feedback occurred informally during the session and alterations made if staff inconvinience was reported. Formal feeback was sought in the post-videotaping questionnaire regarding the impact of the videotaping process.

The primary ethical issues affecting doctors in this study included confidentiality and accurate representation of their actions and interviews. Confidentiality of videotapes and data was maintained as described for patients. Interview consensus documents were deidentified once they were finalised. These word documents and further analysed data was stored in password protected formats.

3.3.3 Students

The major issues affecting student participants that required addressing in this study were consent and confidentiality. Of particular note is the power relationship which existed between student and researcher, due to her academic and assessment responsibilities in the PRCC.

Students were informed of the study by the researcher as a group, however each student was approached individually by the research assistant in regards to participating in the research. Consent procedures were folllowed as for patient participants. All student interviews were performed by a research assistant not associated with the medical course and were not accessed by the researcher until after the 2004 Year 3 examination, to avoid researcher conflict of interest.

3.4 Quantitative methods

For the first part of this study on how and why GPs commit the time to precept medical students, quantitative methods were used to test the following null hypotheses:

- Precepting does not take more time than consulting alone
- Consultation activities do not change when precepting a medical student
- Between-consultation activities do not change when precepting a medical student.

Participants, measures, procedures and statistical tests used in this prospective cohort study are described below.

3.4.1 Participants

During the prospective cohort study, all GPs in the Greater Green Triangle region who supervised Year 3 Flinders University PRCC students in their clinics were personally invited by the author to participate in the study (Appendix 4).
From this group, a purposive sample of GP preceptors was chosen, reflecting the age and gender distribution of the GP supervisors from rural practices involved in the integrated clerkship in Greater Green Triangle region of South Australia.

Precepting GPs were videotaped for a half day consulting session, when they were supervising a student on the day the research team was available to videotape at their practices, and the student consented to be involved in the study (Appendix 5).

3.4.2 Measures

The measures defined for the quantitative study included consultation time, consultation activities, non-consulting time, and non-consulting activities.

3.4.2.1 Consultation time

Consultation time was recorded using the clock on the video. The beginning of the consultation was defined by when the GP and patient first met in the consulting room, and the end of the consultation was defined by the time when either of them departed from the room.

3.4.2.2 Consultation activities

The Davis Observation Code (DOC) was chosen for this study as it has been previously validated as a reliable and valid tool for examining how different treatment environments influence the rates of occurrence of particular GP behaviours.[128]

During the study pilot, the Davis Observation Code was adapted to include categories for direct student teaching, unrecorded time and research (Table 3.2).

Table 3.2 Modified Davis Observation Code

Category	Description
Intro-ductions	***Structuring interaction:*** Dr or pt discussing what is to be accomplished in current interaction ***Chatting:*** Dr or patient discussing topics not related to the visit e.g. small talk or humour which might be used to build rapport
History	***History taking:*** Dr questioning and pt or student describing current complaint or prior illness. ***Treatment Effects:*** Pt response to current treatment. ***Family Information:*** Dr enquiring about family medical or social history. Discussing functioning of family or significant others (social or work related) ***Compliance:*** Dr discussing what pt doing/done regarding *previous requested behaviour* around taking medication, nutrition, exercise or change in behaviour. ***Lifestyle factors:*** relating to the presentation including discussion and questions about exercise, smoking, nutrition (not questions regarding appetite), substance use.
Exam -ination	***Physical Examination:*** Dr performs examination. Dr asks if physical examination produces feeling described in chief complaint or history. Includes preparing for physical exam. ***Procedure:*** treatment or diagnostic procedure e.g. removing skin tags, warts, drawing blood, casting, dressing, debriding, pap smear.
Manage-ment	***Negotiation:*** questions to facilitate pt participation in diagnosis, treatment planning or problem solving, e.g. "What do you think?" "What would work for you?" "How would you feel about doing it this way?" "Are there any ways you think might work?" ***Health Knowledge:*** Dr asks or pt offers what they know about health or a disease ***Counselling:*** Dr discusses interpersonal relations or emotional state of patient or family. Provides reassurance, advice or support, including self-disclosure to reassure. Includes reflecting on pts' verbal cues and nonverbal behaviour. ***Planning Treatment:*** Dr prescribes a medication, diagnostic or treatment plan to be followed, including asking if prescription refill is needed. ***Evaluation Feedback:*** Dr tells pt about results of history, physical examination, lab work etc. Includes reporting ECGs, incomplete, speculative results and requesting patient prepare for physical examination ***Patient question:*** patient asks a question of the Dr regarding their illness or treatment
Health Promotion	***Health Education:*** Dr presents information regarding health to pt, including aetiology, drug effects and treatment or accident prevention. May include statements about health attitudes and motivation. ***Preventive Services:*** Other than those related to the presenting problem. Dr discusses, or plans screening task associated with disease prevention, e.g. pap smear, breast exam, vaccination, hip click exam, testicular exam, rectal exam, thyroid exam, scoliosis exam. ***Health Promotion:*** Dr asks for change in patient's behaviour to promote pt's health in an area unrelated to presenting symptoms. Includes exercise.
Clerical and other activities	***Notes:*** Doctor recording information regarding patient encounter in notes (either written or computerised), includes writing scripts, generating investigation form, request forms, letter writing. ***Diversion:*** Diversion of doctor's attention to a matter other than care of current patient e.g. telephone call, email or exit from room, fixing computer, finding equipment
*Teaching	***Student consent:*** seeking consent from patient regarding student involvement ***Student teaching:*** direct teaching of student with no involvement only secondary advantage to the patient
*Research related	***Research:*** direct discussion of videotape or research related activities
*Not observed	***No data available:*** Doctor is not in camera and activities were not recorded.
*new categories added **Original Source: Callahan and Bertakis 1991[128]**	

3.4.2.3 Non-consulting time in a session

For the purposes of this study, a "session" was defined as a half day of consulting: starting from when the first patient for the day met the GP to when the last patient left the room before a lunch-time or middle of the day break; or starting from when the first patient for the afternoon met the GP to when the last patient of the day left the room. Non-consulting time was defined as all time between consultations during a session.

3.4.2.4 Non-consulting activities in a session

Literature review failed to find any previously validated coding systems for non-consulting time. Code descriptions were developed during a small pilot study of four consulting sessions videotaped prior to this study. Initial categories and descriptions were developed collectively, following independent observation of the tapes. The pilot videotapes were then reviewed and coded independently by researcher and research assistant. Finally, the category descriptions were refined based on the comparison of results of this independent coding.

Non-consulting activities were organised around two axes. Firstly, the researchers defined the focus of the activity: personal, patient, professional, student, or specific to the research study. Secondly, the researchers defined whether the activity was primarily of an organising or preparation nature, or whether it was primarily interactive (Table 3.3).

Table 3.3 Non-consulting activity code descriptions

Category	Description
Personal organisation	Non-work related personal activities including eating, drinking, ablutions
Personal interaction	Socializing with staff, other doctors, students. Content of discussions was not directly work-related
Patient-related organisation	Attending to patient matters e.g. getting drugs for patients, following up investigations for patients, paperwork when no patient in the room
Patient-related interaction	Direct involvement with a patient outside the consulting room (e.g. in the waiting room or treatment area) which was patient focused but not a formal consultation
Professional organisation and interaction	Management issues, staff meetings, medico-political conversations or activities
Professional Interaction	Informal discussions with colleagues or clinic staff re clinical or broader professional matters
Student organisation	Preparing resources for teaching
Student interaction	Active student teaching
Research organisation	Attending to matters specifically related to having research assistant and the video camera in the consulting room
Research interaction	Interacting with others in the practice as a direct result of having research assistant in the practice
Unrecorded	Time not recorded on video or by research assistant
Source: pilot study	

3.4.3 Procedures

Video cameras were placed on the consulting room desk in the study GP's room and in the student's room. This maximised the capacity to view the GP and ensured that patients remained mainly out of camera.

Precepting GPs were initially videotaped for a full session where they consulted with a medical student, and within the next four weeks, during a follow up session, with no medical student, used as a control. During the consulting sessions being studied, the research assistant individually sought consent from each patient when they presented for their appointments prior to the patients entering the consulting rooms (Appendix 6). The cameras were switched on prior to the first patient for the day

entering the consulting room and remained on unless a patient declined to be involved. In such cases the research assistant entered the room with the patient and turned off the camera. Each patient was informed that they could ask for the videotape to be turned off at any point in the consultation.

During the videotaping phase of the study, the research assistant followed the doctor if he/she left his/her consulting room and coded his/her most frequent activity in the preceding 30 seconds using the non-consulting activity categories developed in the pilot study (Table 3.3).

A post-session questionnaire collected GP and student demographics, attitudes and reflections on the sessions. The GP and student questionnaires are attached as Appendix 7 and Appendix 8.

Videotapes were analysed by the researcher and research assistant only. Videotaped consultations were analysed in 15 second intervals and coded using the modified Davis Observation Code for the single most prominent activity in the preceeding 15 seconds. All non-consulting time seen in the video was coded in 15 second intervals using the non-consulting activity categoried. This data set was combined with the data collected in real-time during the session.

3.4.4 Statistical analysis

Mean consultation times were calculated for three consultation types:

1. Solo consultations: when no students were present in the session

2. Precepting consultations: when doctors joined students and patients to complete consultations commenced earlier
3. Parallel consultations: when doctors saw patients on their own during teaching sessions, while students were seeing other patients in separate rooms.

Regression analysis was chosen to determine the relationship between the dependent variable consultation time and the dependent variable of consulting with or without a student. Confounding factors considered in the study included GP demographics and factors recognised in the literature [38,40,53] or proposed by the author as likely to affect consultation time. Only those confounding factors with greater than 15% effect were included in the final regression model. Mixed model analysis was used to account for clustering of consultation times within doctors as it was assumed that consultation times would be affected in a fixed way by the consulting style of any given doctor. Estimated marginal means were calculated taking into account the confounding factors. Estimated marginal means of consulting activities were calculated in the same manner as consultation times.

Regression analysis was also chosen to determine the relationship between the dependent variable non-consulting time in a session, and the dependent variable of consulting with or without a student. Confounding factors considered in the study included GP demographics and other confounding factors from the literature as described above. Mixed model analysis was performed including confounding factors with greater than 15% effect. Estimated marginal means were then calculated taking into account these confounding factors. The combined data set of non-

consulting activites was analysed using mixed method analysis taking into account the same confounding factors.

3.5 Study rigour

The construct validity, internal validity and external validity of the quantitative methodology in this study were considered. The issues affecting these measures of methodological rigour are described below.

3.5.1 Construct Validity

Construct validity is defined as the extent to which the data represent the situation being studied.[129] When measuring time, a pragmatic decision was made to define consulting sessions as the time between the beginning of the first consultation and the end of the last consultation, rather than attempting to define the beginning and end of a GP's work day. The construct validity of GP consulting activities was improved through the utilisation of a previously validated coding system: the Davis Observation Code. No previously validated tool was found for non-consulting activities so an appropriate tool was developed and tested during a small pilot study.

3.5.2 Internal Validity

Internal validity can be defined as the extent to which the research design allows the researcher to draw conclusions about the relationships between variables.[129] Onwuegbuzie[130] is recognised Campbell and Stanley's publication[131] as the authoritative source on internal and external validity for experimental designs. Using

his framework for internal and external validity, the methodological rigour of the quantitative component of this study was considered during three phases of the study: research design and data collection phase; analysis phase; and interpretation phase. These phases are considered individually below.

3.5.2.1 Research design and data collection phase

From Onwuegbuzie's framework, twelve threats to internal validity were recognised during the design and data collection phase (Table 3.4).

Table 3.4 Strategies used to address threats to internal validity in this study during research design and data collection phases

Threat to internal validity	Description	Strategy used to address the threat
History	The longer a study, the more likely extraneous events could offer an alternate explanation	Each matched control consulting session (GP without a student) was videotaped within four weeks of the intervention consulting session (GP with a student) to minimise the risk of rival explanations for any measured differences.
Maturation	The passage of time leads to development which affects the results	Consultation times and activities were measured at the beginning, middle and end of the academic year to account for student / preceptor maturation.
*Instrument-ation	Scores yielded from a measure lack consistency	Coding of activities utilised was performed by a single researcher. Reliability of instruments was checked through a coding audit.
*Statistical regression	Statistical differences between groups represent artefacts	Preceptors' consultation times were compared with the national average to ensure representative sample. Study powered to ensure meaningful statistical results.
Differential selection of participants	Selection bias due to new participants joining a group	GPs acted as their own controls avoiding the risk of differences in control and intervention groups. Equivalency checks in relation to patient demographics were carried out.
Attrition	Participants drop out resulting in differences between the groups	No participants dropped out of the study. Consultations only partially captured on videotape were excluded from the study. This occurred when the tape ran out during the consultation. This occurred with similar frequency in consultations with and without students.
Implement-ation bias	An intervention is implemented to a variable extent	The parallel consulting model assumes students have had an opportunity to see the patients on their own for a meaningful length of time prior to the GP entering the room. Precepting sessions where the student did not have access to his/her own consulting room and was required to shadow the GP were excluded from the study.
Behavioural bias	When an individual has a strong personal bias (for or against the study phenomenon) he/she may alter his/her behaviour to influence the outcome	It is plausible in this study for a GP with a strong opinion regarding precepting to alter his/her behaviour. The risk of this bias is increased as GPs acted as their own controls. Sampling 19 GPs on more than one occasion for half day sessions reduced the risk of an individual GP sustaining an uncharacteristic behaviour for long enough to bias the intervention or control group data.
*Order bias	The order of observations leads to development (eg learning) which affects the dependent variable	GPs were always videotaped consulting with a student before they were videotaped consulting alone. This consistent order bias could result in the second videotaped session (ie the solo session) running more smoothly. This order bias could not be addressed in the study design and therefore increased the risk of a type I error.
Observation bias	Data collectors obtain an insufficient sample	The study used continuous observation in preference to sampling behaviours at random times.
*Researcher bias	Direct observation by the researcher affects participant behaviour	As the author worked as the Academic Coordinator of the program under study there was risk of researcher bias. This was limited though having a second person code the data and ensuring the videotape data was stored for 7 years to ensure the capacity for a research audit.
*Reactive effects	Changes in participant responses (GP, student, patient) due to being aware they are being studied	Hawthorne effect due to obtrusiveness was minimised by having the camera record continuously. The effect of videotaping was assessed through the post- consulting session questionnaire.
* most challenging threats **Source of columns 1 and 2: Onwuegbuzie 2000[130]**		

Of these twelve, the most challenging issues affecting internal validity were: instrumentation, statistical regression, order bias, researcher bias and reactive effects.

- **Instrumentation:** Coding of activities using the Davis Observation Code was performed by a single researcher. Reliability of the coding against the Davis Observation Code was audited by a second researcher independently coding 40 consultations in 15 second intervals. The inter-coder reliability was assessed by counting the number of 15 second intervals where there were discrepancies between the codes allocated by each of the researchers. This was expressed as a percentage of the total number of 15 second intervals coded in the 40 consultations. Reliability of the non-consulting time categories was similarly audited.
- **Statistical regression:** The study was powered to ensure meaningful statistical results. The power of the study was calculated assuming an estimated consultation time of 12 minutes and a standard deviation of 5 minutes. This was based on GP supervisors' standard appointment schedule with appointments booked at 15 minute intervals, and is comparable with Australian national consultation time norms.[132] Independent samples of 114 consultations would have a 95% chance of detecting a two minute increase in the mean consultation time with a student present (single tailed analysis, $p = 0.05$). A two minute increase in mean consultation time when a GP is supervising a student was considered clinically significant by the author. First, clinically significant interventions, such as smoking cessation counselling, can be achieved in two minutes.[133] Second, this time amounts to an extra half an hour per half day consulting session and is equivalent to an extra two patients per half day in rural areas where demand for GP appointments is excessive. A two minute increase in consultation time per patient therefore can theoretically affect both the quality

and quantity of patient care in rural general practice.

- **Order bias:** GPs were always videotaped during precepting sessions prior to solo consulting sessions. There is therefore a theoretical risk in this study that the disruption of videotaping could be less in the solo consulting sessions, resulting in these sessions running more smoothly. This could result in the null hypothesis "that precepting does not take longer" being incorrectly rejected (Type 1 error). The study was however designed this way to avoid the possibility of attrition, due to GPs initially videotaped during solo consultations not being videotaped during a precepting session. Research related activities were coded specifically in order to measure any effect of order bias.
- **Researcher bias:** As the author worked as the Academic Coordinator of the program under study, there was a theoretical risk of researcher bias. This was limited though using the video clock to record time, having an independent coder, auditing the coding of GP activities and ensuring videotapes and coding data will be stored for 7 years, to provide the capacity for further coding and analysis audits in the future. The role of the researcher is addressed further in Section 3.6.2.
- **Reactive effects:** Direct observation through time and motion studies risks the Hawthorne effect where subjects behave differently in the presence of a third party (Crandall 1986). In this study doctors, students or patients could have altered their behaviour as a consequence of the videotape. GP preceptors were consulted prior to the study regarding the acceptability of alternative research methods. They unanimously stated that videotaping was considered less intrusive than having a third party observer in the room. In addition to participant acceptability, videotaping negated the risk of a non-participant observer being unintentionally drawn in to the consultation interaction.[134] Obtrusiveness was

minimised by having the camera record continuously unless turned off by the research assistant. Previous studies have demonstrated that videotaping has minimal reactive effects on physician and patient behaviour.[128,135] In addition, the effect of videotaping was further assessed through the post- consulting session questionnaire.

3.5.2.2 Data analysis phase

Onwuegbuzie's framework recognised six additional threats to the internal validity were identified in the data analysis phase (Table 3.5).

Table 3.5 Strategies used to address threats to internal validity in this study during data analysis phase

Threat to internal validity	Description	Strategy used to address the threat
*Restricted range	Artificial categorisation of continuous variables reduces variance and sacrifices power in the study	Time was measured as a continuous variable. Regression techniques were used rather than artificially categorising continuous variables.
Non-interaction seeking bias	By not testing for the presence of interactions statistical models may be developed which do not reflect reality	Previously recognised confounding factors and other factors suspected by the researcher as likely to be confounders were measured and included in initial regression analysis. Confounding factors with >15% effect were included in the final model.
*Violated assumptions	Dependent variables violate the normal distribution assumption of linear statistics.	Distribution of dependent variables were defined before deciding whether to use linear or non-parametric statistical analysis
*Treatment replication error	Inappropriate unit of data inflates type one errors	Consultations during precepting sessions were classified as either precepting or parallel in recognition of different student effects on individual consultations during these sessions.
*Multi-co-linearty	Regression variables are highly correlated	Correlation of variables was checked prior to inclusion in final statistical model
*Mis-specification error	Missing an important variable from the final statistical model	Risk limited by measuring all theoretical confounders recognised in a theoretical framework based on an intimate knowledge of the study context

* most challenging threats
Source of columns 1 and 2: Onwuegbuzie 2000

The most challenging issues affecting internal validity were: restricted range, violated assumptions, treatment replication error, multicollinearity, and mis-specification errors.

- **Restricted range:** When scale variables such as GP age and patient age are artificially categorised relevant variance tends to be lost resulting in a reduction of statistical power, and reducing the effect size. This could increase the risk of a Type II error (incorrectly failing to reject the null hypothesis). Regression techniques were used as they have been found to be consistently superior to Analysis of Variance (ANOVA) and Analysis of Covariance (ANCOVA) methods when groups are not randomly assigned.[130,136,137]
- **Violated assumptions:** In the case of consultation time and non-consulting time, the dependent variables were assessed for normality of distribution prior to choosing linear or non-parametric statistical analysis methods. These dependent variables were expected to have a skewed distribution, violating the normal distribution assumption of linear statistics, as the range of consultations times in Australia has previously been shown to have a positive skewness with an extended tail of prolonged appointments.[132]
- **Treatment replication error:** When data collected does not specifically relate to the unit of analysis Type 1 errors are more likely (falsely rejecting the null hypothesis) due to increasing effect size estimates. Analysing individual consultations as the data unit when the GP received the intervention (precepting a student) could be considered as a violation of the independence assumption. Consultations were used as the data unit in recognition of the variable effect of students on different doctor-patient combinations. Mixed model statistical analysis was used to account for the clustering effect of consultation times and activities associated with a GP's individual consulting style.

- **Multico-linearity:** exists when independent confounding factors included in the final regression analysis model are highly correlated. This can lead to inflated statistical coefficients, affecting the predictive power of the dependent variable being tested. Correlations of variables were checked prior to including in the final model and excluded if the correlation coefficient (r) was greater or equal to 0.9 in order to address this threat.
- **Mis-specification errors:** Omitting one or more important variables from the final model can risk internal validity of a study. This often stems from weak or non-existent theoretical frameworks. Although it is difficult to recognise and address this risk prospectively, developing a theoretical framework based on an intimate knowledge of the study context may limit this risk. Several variables which logically affected GP time constraints, which were not found in the literature, were included in the data collection in an attempt to reduce the risk of omitting an important confounding variable. These included: measure of remoteness of practice, years the GP has worked this practice, number of years precepting in the last five years, preschool children living at home, and season.

3.5.2.3 Data interpretation phase

In the data interpretation phase, five threats of internal validity were considered using the framework (Table 3.6).[130]

Table 3.6 Strategies used to address threats to internal validity in this study during data analysis phase

Threat to internal validity	Description	Strategy used to address the threat
*Effect sizes	Inappropriate interpretation of statistical significance	Effect size is taken into account by interpreting statistically significant findings in terms of their clinical significance.
*Conformation bias	The tendency for interpretations of new data to be consistent with preliminary hypotheses	The author sorted and critically appraised plausible rival explanations for results consistent with the preliminary hypotheses
Distorted graphics	Inaccurate interpretation of histograms and other graphs can lead to inappropriate statistical assumptions	Graphic checks were triangulated with empirical evaluation by undertaking statistical tests for normality of distribution
*Illusory correlations	The probability of Type 1 errors increases with increased sample size	Sample size was not large enough in this study to contribute significantly to the probability of Type 1 errors.
*Casual error	Researchers can infer cause-and-effect relationships from statistically correlated variables	Inference of causality was not made during the analysis phase unless all the requirements of causality were met.
* most challenging threats **Source of columns 1 and 2: Onwuegbuzie 2000[130]**		

The most important risks to internal validity included: effect size, conformation bias, illusory correlation and causal relationship (Table 3.6).

- **Effect size:** This describes the risk of confusing the statistical significance of an event with the practical or clinical significance of an event. This was avoided by only looking for a statistical effect which had previously been defined as clinically significant.
- **Conformation bias:** There is a tendency for interpretations of new data to be consistent with the researchers' preliminary hypotheses. The author sought to make her preliminary theoretical framework explicit, allowing readers to judge whether critical appraisal of hypotheses had occurred and whether plausible rival explanations were adequately explored.
- **Illusionary correlations:** As sample size increases, so does the probability of rejecting a true null hypothesis creating a Type 1 error. The relationship in this situation is not real but represents an illusionary correlation. This risk was

addressed by recognising that the study was powered to measure a two minute difference in consultation time. If the effect size for any statistically significant relationship was not of practical significance, then a finding would be interpreted cautiously.

- **Causal Error:** Statistically significant correlations found in this study were only interpreted as causal relationships if: the independent variable preceded the dependent variable in time; there was a functional relationship between variables with no third causative variable; and there was a logistical link between the two variables that substantiated the likelihood of a causal link.[138]

With the strategies discussed above in place, the internal validity of the study was considered to be acceptable.

3.5.3 External Validity

External validity can be defined as the extent that the study findings can be generalised from the sample, to the populations and settings specified in the research hypothesis.[96] Seven threats to the external validity of this study were recognised using the Onwuegbuzie framework for validity (Table 3.7).[130] Of these, four factors were considered especially important: population validity, ecological validity specificity of variables, and mis-specification error.

- **Population validity:** This is a threat in nearly all small educational program studies regardless of the level of internal validity. This study is no exception. There always exists the possibility that the population of GPs involved in the GGT PRCC program possess unique qualities which affect precepting time. Low population validity necessitates conservative generalisations of quantitative

results and demands external replications of time and motion studies. Demographic details, teaching experience and style of practice were collected as part of the post observation questionnaire, and compared with state and national data to define the representative nature of the sample.

- **Ecological validity:** This describes the extent to which the findings are independent of the setting. This study was set in Australian rural general practice where clinic infrastructure allowed students to consult from their own rooms in parallel with their GP preceptors. There may, however, be other ecological factors as yet unaccounted for, which affect the quantitative results. The clinic settings were described as part of the background to the study findings.
- **Specificity of variables:** In order to counter threats to external validity, the researcher was careful to define variables in a way that had meaning for readers outside the study setting. Operationally defined variables included consultation, session, and behaviour types. These allowed the researcher to discuss the transferability of findings accounting for the contextual limitations of the study.
- **Mis-specification error:** If one or more important variables are missed, the final model may have acceptable internal validity; however the omission will reduce the external validity, as it will be unclear if the results would have been the same if the variable was included. This error can be exceedingly difficult to detect. In this study the researcher has attempted to minimise this risk through including variables deemed relevant following extensive literature review and the prior development of a preliminary conceptual framework based on the evidence in the literature. Variables included in the final model were made explicit.

Table 3.7 Strategies used to address threats to external validity

Threat to external validity	Description	Strategy used to address the threat
*Population validity	The study population cannot be assumed to represent the target population	Demographic details, teaching experience and style of practice were collected as part of the post observation questionnaire.
*Ecological validity	Extent to which findings can be generalised across settings	The clinic settings were described as part of the background to the study
Temporal validity	Extent to which findings can be generalised across time	Data collection occurred during the 2004 academic year. Differences between the beginning and end of the year were accounted for by measuring and analysing consultation time and activities throughout the year.
Researcher bias	Findings may be dependent in part on the characteristics and values of the researcher	In this study, the theoretical perspective of the study and background of the researcher have been made explicit in the literature review.
Reactive arrangement	Changes in participant responses (GP, student, patient) may be due to being aware they are being studied	The effect of being videotaped was reported by GPs as part of the post observation questionnaire in order to assess the implications of any Hawthorne effect. Obtrusiveness was minimised by having the camera record continuously.
Order bias	The order of observations leads to development (eg learning) which affects the dependent variable	Order bias is not considered significant in this study as GP preceptors alternate between precepting and lone consulting sessions throughout their professional lives.
*Specificity of variables	The more unique to participants, time, context, conditions and variables the less generalizable the results	The researcher operationally defined variables including: consultation, session, behaviour types This allowed her to discuss the transferability of findings accounting for the contextual limitations of the study.
*Mis-specification errors	Missing an important variable from the final statistical model	Risk limited by measuring all theoretical confounders recognised in a conceptual framework based on an intimate knowledge of the study context
* most challenging threats **Source of columns 1 and 2: Onwuegbuzie 2000[130]**		

Having considered the quantitative methods and discussed the strategies employed to ensure methodological rigor, qualitative methods are described below.

3.6 Qualitative methods

The second part of the study sought to understand what precepting is like in the PRCC program within the environment of a rural clinic. The use of qualitative methods complemented the findings of the first part of the study, as observing behaviour does not provide understanding of a participant's experience.[139]

Interview data from GP preceptors was triangulated with reflections from practice managers and medical students. These data were compared with GPs from other contexts, and the videotaped data analysed by the researcher. The questions posed included:

- How do rural GPs perceive the time committed to precepting?
- How do GPs interpret the experience of precepting a medical student?
- Why is the precepting experience meaningful for GPs?

3.6.1 Context

The context of this study was the Greater Green Triangle Parallel Rural Community Curriculum (GGT PRCC), where Year 3 graduate entry medical students from Flinders University spend their penultimate year based in a general practice, and learn the foundations of medicine across the whole curriculum. In this study, GPs who precept medical students using a parallel consulting model, were interviewed to determine their perceptions of the time commitment involved and their experience of precepting, to derive the meaning of precepting to this group.

3.6.2 Role of the researcher

The researcher has worked as a rural doctor in the GGT region since 1992, initially as a GP registrar and then as a partner in a practice. She has a longstanding relationship with GPs in the region consolidated through her role as Medical Director of the Limestone Coast Division of General Practice (2000 – 2003). She was responsible from 2001 for the development and implementation of the GGT PRCC. She worked as a GP preceptor for medical students in her own practice. She remains

active as a clinician in Mount Gambier. In her clinical and academic roles, the author has an established peer relationship with the GP preceptors in the study and this facilitated the engagement of GPs in the study. A small number of the patients in the study would also have been familiar with the author.

The students were familiar with the researcher through her clinical teaching and small group learning activities. This may have influenced their participation in the study. The researcher was recognised by the students in the study as a key academic responsible for delivering the PRCC curriculum and, in part, for student assessment in this challenging year of medical school. The possible effect of this power differential between the author and students was managed in this study by blinding the author to the student participation initially. As described in the Ethics section above, the student interviews were performed by a research assistant not associated with the medical course. The researcher gave an undertaking to the students that the interview transcripts would not be read by the author until after the 2004 Year 3 examination results were confirmed by the University and known by the students.

Social research commentators have expounded the virtues of fieldwork conducted by "an alert social scientist who has thorough local acquaintance".[140] The researcher's close association with the subject of investigation and the research participants prevented the difficulties of gaining access to GP preceptors and students involved in the PRCC. Immersion in the PRCC program assisted with interviewing and interpretation of data, as the researcher understood the common language nuances used by research participants relating to Australian general practice and precepting.

3.6.3 Critical reference groups

Prior to the commencement of the research, in December 2003, seven GPs who precept students in a PRCC program associated with Flinders University but in another region, attended a focus group to consider the list of interview questions drawn up in response to the literature review, and to bring their perspectives of the impact of medical students to the researcher. Consent was obtained to record and transcribe the focus group discussions. The primary objective of this focus group was to assist with the development of the semi-structured questionnaire proforma (Appendix 10) by ensuring the questions included would allow GPs to cover a broad content field without directing them too specifically. Prompts, which were developed following an extensive literature review, were fine tuned as a response to focus group discussion.

Preliminary results from the study data analysis were presented to a similar focus group of GP preceptors from PRCC programs outside GGT region in April 2008 and July 2008. Comments received were recorded in the research journal and informed the further analysis of the data. Finally, the provisional conceptual framework developed from the research was presented to Greater Green Triangle GP preceptors at two formal meetings in late 2008 and comments received informed the final analysis.

3.6.5 Interviews

The semi-structured interview proforma was piloted and interview technique practised by interviewing an academic supervisor with prior experience precepting medical students.

Interviews occurred during three blocks of time as reported in the research timeline (Table 3.8). Initially ten GP preceptors were randomly chosen for interview from the cohort of GP preceptors in the GGT PRCC program. Practice managers from the four PRCC practices were also invited to participate. Theoretical sampling of GP preceptors of short term student rotations and GPs within the PRCC practices actively choosing not to precept occurred in the second and third data collecting periods, in order to ensure capture of a broad diversity of perspectives. This sampling technique allowed the researcher the opportunity to explore emerging theories through the exploration of negative cases. The data collection timeline illustrates when videotaping and interviews were conducted and demonstrates how these data were collected concurrently (Table 3.8).

Table 3.8 Research timeline

Date	Description of research activity
2003	Preliminary literature review Focus group with GGT GPs to discuss acceptable observation methods Development and pilot of observation and interview tools Ethics approval Expert reference group meeting Testing of interview proforma Trial of videotaping and real-time data collection
2004	Data collection period
Week 4 - 8	Early year videotaping GP preceptor sessions with students present Semi-structured interviews PRCC GPs, precepting GP (non-PRCC) , practice managers
Week 8 - 12	Second early year videotaping GP preceptor sessions without students videotaped PRCC students interviews by research assistant
Weeks 22 - 26	Mid year videotaping GP preceptor sessions with students present Semi-structured interviews with PRCC GPs, precepting GP (non-PRCC) and PRCC GPs not precepting
Weeks 26 - 30	Second mid year videotaping GP preceptor sessions without students videotaped PRCC students interviewed by research assistant
Weeks 37 - 41	End of year videotaping GP preceptor sessions with students present Semi-structured interviews with PRCC GPs, and precepting GP (non-PRCC)
Weeks 41 - 45	Second end of year videotaping GP preceptor sessions without students videotaped
Week 44	Student exams
2005	
January	Access by author to student interviews
2005+	Analysis of data by author
Source: research journal	

Interviews with GPs and practice managers were arranged formally in advance through personal telephone contact from the researcher, followed by an email including a copy of the consent form. Interviews took place in the GP's consulting room or practice manager's office, usually at the end of the day, or at a convenient location and time nominated by the research participant. On first meeting, the research participant was presented with the consent form and the protocol of the interview. This was discussed prior to commencing the audiotape. Interviews were taped and notes taken at the time of interview. The length of the interview was determined by the research participant and ranged from 20 minutes to 55 minutes.

A semi-structured open-ended interviewing technique was used to allow all participants to fully describe their own experiences and perspectives, particularly those that were unique and meaningful. The order of the predetermined questions was altered in response to the participant's story, allowing responses to guide further questions. Not all predetermined prompts were utilised in each interview, as a balance was reached between the interviewer and interviewee to provide room for expansion and clarification of the interviewee's responses.

Student interviews were carried out by the research assistant using the same protocol and, in accordance with ethics approval requirements, were not reviewed by the researcher until after the completion of the academic year following the release of the students' final results for Year 3.

3.6.6 Creating consensus documents

Interviews were transcribed by an assistant and proof read by the researcher with

reference to the audiotape. Alterations were made to correct transcription errors and remove identifiers. A copy of this co-authored interview consensus document[112] was returned to the interviewee by email or hardcopy for review, to ensure the transcript accurately reflected the content and meaning of the participant. Once reviewed by the interviewee, this consensus document constituted the raw data. These word documents were then transferred directly into NVivo, minimising the risk of transcription error.

3.6.7 Data analysis

Due to constraints imposed on the study methods because of the relationship of the researcher to the subjects, definitive coding took place only after data collection was finished. This method still met the requirements of a grounded theory approach as saturation of themes was achieved and there was clear evidence of data redundancy occurring in the interviews.[141]

Consensus documents were analysed, using N Vivo, by procedures proposed by Strauss and Corbin[120] and described below: open coding, axial coding, selective coding, theoretical saturation, and development of a theoretical framework.

Documents were initially read through by the researcher to get an overall view of the content. Documents were then reviewed and open coding performed to define content groups. Although this study utilised a grounded theory approach, some content categories had been previously defined from the loose conceptual framework described at the end of Chapter Two (Figure 2.3).

Many more codes were developed "in vivo".[120] As the data were sorted into codes, labels were created for the codes that reflected the words of the research participant. Memos and reflective notes were written to record reflections and analytic ideas.

The large numbers of initial codes were reviewed and organised into clusters. This step was done several times, as different cluster patterns were considered using a process of constant comparison.[120] Axial coding, the process of relating codes to each other, helped to define the properties and dimensions of themes emerging from the data, giving concepts greater explanatory power. The development of these category "trees" allowed the researcher to begin to explain what was going on in the data. The researcher then returned to the original data to ensure that the categories identified by the axial coding were representative of the original interviews and that rival explanations did not fit better with the data. An example of a category developed through axial coding is seen in figure 3.1.

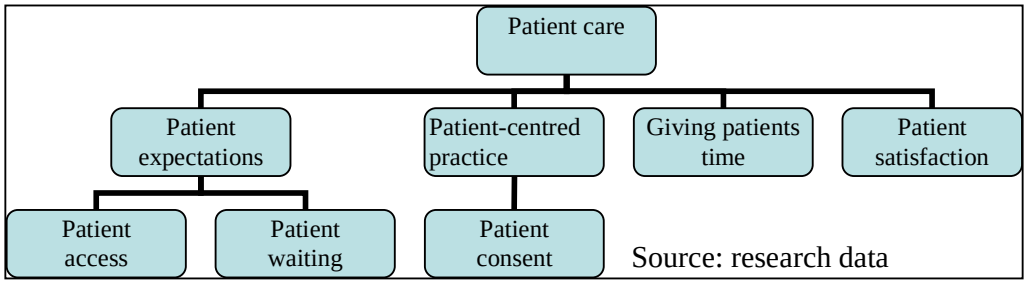

Figure 3.1 Patient care category developed through axial coding

Once contextual sensitivity of the codes was satisfied and theoretical saturation had been reached, the categories were further refined and integrated to develop abstractions. The abstractions, although no longer related directly to the specific data

from an individual case, had relevance for and were applicable to all cases in the study.[120] This process of pattern coding or meta-coding involved the development of broad concepts which were modified to ensure they were representative of the research material through constant comparision with the data. [104] These expanded codes entail a greater level of abstraction.

The abstractions and the definitive relationships between them were organised and memos used to generate theory that posed explanations. The mini-theories in the memos were integrated to produce a theoretical framework which was again compared with the original data. The work with abstractions was undertaken in an inductive manner, as the researcher was not testing established generalisations or theory presented in prior literature, but was generating theories that underlie and explain how and why GPs commit the time to precept.

3.7 Rigour of qualitative methodology

In response to the desire to assess the quality of qualitative research there have been several recent attempts to develop guidelines for doing and judging qualitative research.[142,143] In this study, the discussion of case study rigour was based on five main issues raised by Miles and Huberman,[104] where traditional terms that apply to quantitative research have been paired with alternative criteria more relevant to qualitative research:

- Objectivity / confirmability;
- Reliability / dependability / auditability;
- Internal validity/ credibility / authenticity;

- External validity / transferability / fittingness;
- Utilisation / application / action orientation.

3.7.1 Objectivity / confirmability

The primary threat to confirmability in this study is the risk that the conclusions depended on the perspective of the enquirer rather than "the subjects and the conditions of the enquiry".[144] In order to address this, strategies were put into place to address relevant queries arising from critical appraisal of the work (Table 3.9). Reflexivity has been ensured by explicitly stating the position of the researcher. Readers are enabled to judge the research process through thorough documentation of the steps taken in reaching the thesis conclusions.

Table 3.9 Relevant questions to address confirmability

Relevant questions **Source: Miles and Huberman 1994[104]**	Strategies used to address the question
Are the general methods and procedures described explicitly and in detail?	A complete description of the methods including "backstage information" [104] is included in the thesis. This information came from the research journal which was kept during the research project.
Can the reader follow the actual sequence of how data were collected, processed, condensed/transformed and displayed for specific conclusion drawing?	
Are the conclusions explicitly linked with exhibits of condensed/displayed data?	Results include displays of condensed data and are referenced to their original source.
Is there a record of the study's methods and procedures detailed enough to be followed as an audit trail?	The research journal provides an audit trail. This information was summarised in the methods section.
Has the researcher been as explicit and self-aware as possible about personal assumptions, values and biases, affective states – and how they may have come into play during the study?	The position of the researcher is stated explicitly in the section entitled "Role of the Researcher". Power issues are further discussed in the ethics section. The researcher attended systematically to the context of knowledge construction, especially the effect of the researcher herself.
Were competing hypotheses or rival conclusions really considered? Do other rival conclusions seem plausible?	Competing hypotheses were considered during the analysis of qualitative results and reflections regarding these are included in the results and discussion
Are study data retained and available for reanalysis by others?	The study data has been retained in a locked filing cabinet in the researcher's office for the purposes of audit or reanalysis.

3.7.2 Reliability / dependability / auditability

The underlying issue here is whether the process of the study was consistent and done with reasonable care. In this study, threats to dependability were addressed by using multiple sources of evidence to triangulate the data obtained, including objective measurements of time, GP preceptors' reported experiences of time and third party (student and practice manager) perspectives. A clear chain of evidence was provided with explicit links between steps. Key informants were provided with opportunities to review their interview consensus document, drafts of the results and the evolving conceptual framework (Table 3.10).

Table 3.10 Relevant questions to address dependability

Relevant questions **Source: Miles and Huberman 1994 [104]**	Strategies used to address the questions
Are the research questions clear, and are the features of the study design congruent with them?	The research question was clarified by the researcher and presented to the higher degrees committee as part of the application for PhD candidature. This formed the basis for the introduction chapter.
Is the researcher's role and status within the site explicitly described?	As described above, the position of the researcher is stated explicitly in the section entitled role of the researcher. Power issues are further discussed in the ethics section. The literature review allowed the author to share preconceptions.
Do findings show meaningful parallelism across data sources (informants, contexts, times)	Triangulation of data sources allowed for the development of common themes; however it is also important to recognise that other significant and interesting findings which fell outside the triangle were also included [145].
Are basic paradigms and analytic constructs clearly specified?	Reliability depends, in part, to its connectedness to theory. The theoretical perspective of the researcher and the contributing conceptual frameworks were reported in the thesis establishing the author's potential biases.
Were data collected across the full range of appropriate settings, times, respondents suggested by the research questions?	Data was collected through interviews with a broad range of GP preceptors in the GGT PRCC, triangulated with data from practice managers and students and contrasted with non-precepting GPs and GP preceptors in other rural SA contexts. Data was also collected across the academic year.
If multiple field workers are involved, do they have comparable data collection protocols?	A second interviewer was involved in interviewing the students in this study. An interview protocol was developed and structured proforma used during interviews.
Were coding checks made and did they show adequate agreement?	Coding checks were made by the researcher by frequently returning to the original data. Category descriptions were reviewed until they adequately reflected the data.
Were data quality checks made (for bias, deceit, informant knowledge?)	Defining consensus documents rather than simply transcribing audio-taped interviews avoided the risk of misinterpreting verbal statements during the process of translating interviews to written word. It also made transparent the author's constructionist epistemology.
Were any forms of peer or colleague review in place?	The critical reference group provided the researcher with two occasions for formal peer review. The research supervisors provided critique of the methods during the data collection and analysis.

3.7.3 Internal validity/ credibility / authenticity

The credibility of a piece of qualitative research is related to the extent to which the research design allows conclusions to be drawn (Table 3.11). In this study, questions regarding credibility were addressed by: detailing the context of the study; triangulating methods as part of the case study approach; explicitly describing the methods of data analysis; organising abstractions to develop a theoretical model; and then presenting the provisional model to key informants for comment.

Table 3.11 Relevant questions to address credibility

Relevant questions **Source: Miles and Huberman 1994 [104]**	Strategies used to address the questions
How context rich and meaningful ("thick") are the descriptions?	Details of the context of the GP preceptors involved in parallel consulting in the GGT PRCC were described to create a rich impression of the case study circumstances in order to allow the reader to understand the arrangements in the local context and judge the logic of the account
Does the account "ring true", make sense, seem convincing or plausible, enable a "vicarious presence" for the reader?	
Is the account rendered a comprehensive one, respecting the configuration and temporal arrangement of elements in the local context?	
Does triangulation among complementary methods and data sources produce generally converging conclusions? If not is there a coherent explanation for this?	Triangulation of data sources allowed for the development of common themes. Other significant and interesting findings which fell outside the triangle were included and alternate hypotheses for these findings were discussed [145].
Are the presented data well linked to the categories of prior emerging theory? Do the measures reflect the constructs in play?	Methods of data analysis were explicitly described. Results were presented to demonstrate internally coherent categories reflecting the constructs found in the original data. The abbreviated grounded theory approach created the possibility of not reaching saturation for some themes. Rules used were described explicitly in the research journal and summarised in the thesis text.
Are the findings internally coherent; are concepts systematically related?	
Are rules used for confirmation of propositions and hypotheses made explicit?	
Is negative evidence sought? Found? What happened then?	Negative evidence was sought through interviews of GPs who chose not to precept
Have rival explanations been actively considered?	Rival explanations considered are described and then arguments made for qualifying the pattern codes which had emerged.
Are the conclusions considered to be accurate by original informants? If not, is there a coherent explanation for this?	The provisional theoretical framework developed from the research was presented to Greater Green Triangle GP preceptors and considered accurate.

3.7.4 External validity / transferability / fittingness

The transferability of qualitative research can be described as a measure of how far

the conclusions of this study can be transferred beyond the study context. Risks include over generalisation of conclusions without appropriate qualification. The strategies used in this study are described in Table 3.12, and include theoretical sampling to ensure theme saturation, and explicitly describing the context of the study to allow readers to transfer findings appropriately.

Table 3.12 Relevant questions to address transferability

Relevant questions **Source: Miles and Huberman 1994[104]**	Strategies used to address the questions
Are the characteristics of the original sample of persons, settings, processes fully described to permit adequate comparisons with other samples?	The characteristics of the research participants, the Australian rural general practice context and the PRCC program were described to allow readers to judge the transferability of the conclusions to their own environment.
Does the report examine possible threats to generalisability? Have limiting effects of sample selection, the setting, history and constructs used been discussed?	
Do findings include enough "thick description" for readers to assess the potential transferability, appropriateness for their own settings?	
Is the sampling theoretically diverse enough to encourage broader applicability?	Theoretical sampling occurred during the study in order to saturate themes and ensure pattern codes were qualified.
Does the researcher define the scope and the boundaries of reasonable generalisation from the study?	The researcher qualified the study conclusions in line with the unique contextual and cultural variables reported in this study.
Is the transferable theory from the study made explicit?	The conceptual model produced by the study is described thoroughly
Have narrative sequences (plots, histories, stories) been preserved unobscured? Has a general cross case theory using the sequences been developed?	This study aimed to provide a general cross case theory while preserving the voice of individual GP preceptors.
Does the report suggest settings where the findings could fruitfully be tested further?	Suggested settings of further studies were considered and discussed in the Chapter 8.

3.7.5 Utilisation / application / action orientation

Even if a study is found to have methodological rigour, Miles and Huberman [104] argue the importance of considering the value of the research to participants, both researchers and researched. Lincoln[146] describes the "empowerment criteria" as the ability of the study to evoke and facilitate action on the part of those affected directly and indirectly to take action. The intention of this research is to understand and facilitate mutually beneficial experiences for preceptor and student. Certainly the GP

preceptors who were presented with preliminary data analysis, reported the provisional theoretical framework to be powerful.

3.8 Summary

This chapter described in detail the historical background of the two dominant theoretical perspectives in medicine and then argued the case for the value of a constructivist theoretical perspective in this study. The case study design using both qualitative and quantitative methods was justified and described. The ethical considerations of this study were presented. This study was constructed in two parts.

A prospective cohort study based on analysis of videotaped consultations was described, considering sampling, data collection tools, data collection processes and analysis methods. The important issues of construct validity, internal validity and external validity were examined using a framework for internal and external validity. Strategies used during this study to minimise these risks were highlighted.

An interpretive study of GP preceptor interviews triangulated with interviews from students, practice managers, GPs who chose not to precept and GP preceptors of short-term student placements was presented. Description of methodological rigour addressed confirmability, dependability, credibility and transferability.

This chapter has shown how the study design was appropriate for the research questions. The results found from this research can be regarded as having strong internal validity. As with most naturalistic studies, further studies will be required to confirm the generalisability of the findings to other contexts.

4 TIME COMMITTED TO PRECEPTING

4.1 Introduction

The previous chapter described the methods used in this study. In this chapter, the time committed by GPs when they precepted medical students is defined.

First, objective measures of consultation times during solo and precepting sessions were compared to determine the difference in consultation times when precepting medical students. Second, a similar process of comparison of non-consulting time within precepting and solo sessions was performed. This information provided an objective measure of the time taken in a GP's working day, when precepting a medical student using the parallel consulting model.

The perceptions of GP participants were then triangulated with this objective data from videotaped consulting sessions, and several alternative explanations for the results explored.

4.2 Study context

This study took place primarily in four general practice clinics situated in towns in the GGT region (Table 4.1). Three practices were situated in towns of >9,000 people which had a secondary referral hospitals supported by resident specialists. Some GPs in these clinics had procedural roles within the hospitals. One practice was situated in a town of 5000 people, some 50km from the secondary referral hospital. Inpatient care at the local community hospital was provided by GPs. All four clinics were

large rural practices with practice managers, computerised medical records, nursing staff providing clinical duties in minor procedures areas within the clinics in hours, and the GPs providing out of hours services.

Table 4.1 Medical clinics participating in the study

Clinic	A	B	C	D
Population of town	23,500		5,000	14,400
Hospital	Secondary referral		Community	Secondary referral
Resident specialists	Physicians, general surgeons, orthopaedics, O&G, paediatrics, anaesthetics, ophthalmology		Nil	Physicians, general surgeons, anaesthetics, O&G, ENT
No of GPs	7 male, 3 female	6 male, 2 female	5 male, 3 female	8 male, 2 female
Doctors in training	1 GP registrar, 1 intern	Nil	1 GP registrar	3 GP registrars
No of consulting rooms	14	9	9	12
Separate nurses's area with designated nursing staff	yes	yes	yes	yes
Practice manager	yes	yes	yes	yes
Computerised records	yes	yes	yes	yes
Provision of after hours clinics	yes	yes	In Emergency Dept	yes
Students have access to consulting room 2 sessions per week	yes	yes	yes	yes
Student study room in clinic	yes	yes	yes	yes
Participants interviewed	7 GPs, 1 PM, 1student	6 GPs, 1 PM, 2 students	6 GPs, 1 PM, 2 students	5 GPs, 1 PM, 2 students
GPs videotaped	5	4	5	3
Source: Field notes				

Students in these clinics had a similar program with a one day a week student study day, two to three rostered clinical sessions based outside the clinic, two formal parallel consulting sessions and about three sessions per week on-call based in the clinic to study and catch up with individual patients.

4.3 Case study participant characteristics

There were two overlapping groups of case study participants involved in this case study.

4.3.1 Qualitative study participants

The participants involved in the qualitative semi-structured interview study represented a theoretical sampling (Table 4.2). No comparative analysis of the demographics of this group was done as this group was not intended to be demographically representative. They were invited to participate to provide a breadth of perspectives.

Table 4.2 Defining interview participants

		Male		Female		Total
		<45 years	>45 years	<45 years	>45 years	
PRCC GP preceptors	E	1	2	1	1	4
	M	2	2	2	1	7
	L	4	2	1	2	9
PRCC GPs not precepting		1	-	1	1	3
GP preceptors – attachments<6weeks		2	2	1	-	4
PRCC practice managers		2		2		4
Other practice managers		0		1		1
PRCC students		2		5		7
Total interviews		**22**		**19**		**41**

Total of 41 interviews
E = early in the academic year; M = mid-year, L = last few weeks of the academic year
Source: interview data

During the study, 21 Greater Green Triangle PRCC GP preceptors participated in interviews. In this study they will be identified using the symbol “GPp”. Five were

interviewed early in the academic year, seven mid year and the remaining nine in the last few weeks of the academic year when students had been attached to the clinic for more than 40 weeks (Table 4.2). Their perspectives were triangulated with four practice managers (PM) and seven PRCC students (S). These data were compared and contrasted with three GPs in the GGT PRCC clinics who had chosen not to be involved in precepting these students (GPn) , and finally with five committed preceptors taking Flinders University medical students for short term attachments (two week and six weeks duration) for at least 18 weeks a year (GPa). Consensus documents from interviews with the forty one participants made up the qualitative data presented in the results below.

The majority of these PRCC GP preceptors also participated in the videotape part of the study. This included: four of the six males under 45 years, all the males over 45 years, three of four females under 45 years and two of four more mature females.

4.3.2 Quantitative study sample

The sample of GP supervisors videotaped consisted of 76.5% males with and average age of 42.6 years (Table 4.3). This is comparable to the current SA rural doctor demographics of 73% males, and average age of 45.4 years.[37]

All 2004 PRCC students approached to participate consented to take part in the observational study. By approaching patients personally to explain the purpose of the study and seek consent, an 86% patient consent rate was achieved. A mean of 1.6 patients per session declined to participate in the study, with no statistical difference between solo and precepting sessions ($p = 0.985$). The videotapes of several

consultations were incomplete as the videotape ran out during the ocnsultation. These were excluded from the study. Again there was no statistical difference in number of incomplete consultations in the solo and precepting sessions (p= 0.677)

Table 4.3 Purposive sampling of teaching GPs to account for age and gender

	Gender Male				Gender Female				Total GPs
	Age <=45		Age >45		Age <=45		Age >45		TOTAL
	no	%	no	%	no	%	no	%	
GPs in study practices	14	34.1%	14	34.1%	9*	22.0%	4	9.8%	41
GP preceptors in these practices	10	35.7%	12	42.9%	4	14.3%	2	7.1%	28
Consenting GP preceptors	9	33.3%	12	44.4%	4	14.8%	2	7.4%	27
GPs videotaped	6	35.3%	7	41.2%	3	17.6%	1	5.9%	17
Source: videotape data									

A total of 523 complete consultations involving 17 general practitioners and 9 students was videotaped during the 2004 academic year. These consultations were categorized into three groups, depending on the involvement of a medical student:

- ‘solo’ consultations - when no students were present in the session;
- ‘precepting’ consultations - when a student saw the patient prior to the doctor;
- ‘parallel’ consultations - when the doctor saw a patient on his/her own during a teaching session while a student was seeing another patient in a separate room.

There were 257 solo consultations, 133 precepting consultations, and 133 parallel consultations.GP characteristics were aggregated and considered as descriptive features of the 523 consultations (Table 4.4).

Table 4.4 GP characteristics by study consultations

GP Characteristics	Number of study consultations	Percentage of study consultations	Rural SA GP demographics†
GP gender male	432	82.6%	75.0%
Country of birth Australia	293	56.0%	54.9%
medical degree obtained in Australia	320	61.2%	67.0%
medical degree obtained in UK	61	11.7%	7.5%
FRACGP or equivalent	251	48.0%	*
FACRRM or equivalent	152	29.1%	*
3 or more degrees including basic medical degree	234	44.7%	*
>= 8 sessions per week	465	88.9%	75.0%
Hospital inpatients	480	91.8%	85.9%
Procedural GP	280	53.5%	*
Practices obstetrics	190	36.3%	26.0%
Practices anaesthetics	53	10.1%	19.0%
Practices surgery	33	6.3%	9.0%
Preschool children living at home	300	57.4%	*(75% had dependent children)
GP Characteristics	**Mean**	**Standard deviation**	**Rural SA GP demographics†**
Age (years)	41.5	7.0	45.4
Years in rural practice	9.7	8.3	12 (median 8.25)
Years in this practice	8.4	8.3	*
Number of years in the last five precepting	3.4	1.3	*

*comparative information unavailable
† Source: Fleming 2007[37]
Source: videotape data

The majority of consultations recorded for the study were provided by males (83%) with an Australian medical degree (61%) or UK medical degree (12%) working eight or more sessions per week (89%) and providing hospital inpatient services (92%). This data is again comparable with the current population of rural GPs in South Australia.[37] Percentages of GPs providing obstetrics, anaesthetics and GP surgery were however somewhat different. Interestingly, the larger percentage of GP preceptors in this cohort practising obstetrics is consistent with a previous study, which found that preceptors saw more patients for obstetric and gynaecology

examinations than their non-precepting peers.[40] Comparative information was unavailable for other data collected. All the GPs in this study worked in clinics with Rural, Remote and Metropolitan Area (RRMA) category four or five.

Information was collected from students regarding the reported frequency preceptors engaged in seven effective teaching behaviours previously identified in the primary care setting.[147] Over 80% of GP preceptors were reported to frequently: involve the student actively in the consultation; demonstrate clinical and professional competence; balance clinical and teaching responsibilities; and foster a supportive interpersonal relationship (Table 4.5). Over 65% of GPs were reported to frequently emphasise problem solving. Using an organised approach, including goal setting and summarising and providing feedback regarding the student's performance work, were less frequent GP preceptor behaviours.

Table 4.5 Frequency of effective teaching behaviours

Teaching characteristics	Occurred rarely	Occurred frequently	Percentage reported frequently demonstrating trait
Student reported GP frequently involved them actively in consultation	5	262	98.5%
Student reported GP frequently demonstrated clinical and professional competence	0	259	97.4%
Student reported GP balanced clinical and teaching responsibilities	40	226	85.0%
Student reported GP frequently fostered a supportive interpersonal relationship	52	214	80.5%
Student reported GP frequently emphasised problem solving	63	182	68.4%
Student reported GP frequently used an organised approach including goal setting and summarisation	92	113	42.5%
Student reported GP frequently provided feedback regarding their clinical performance	107	84	31.6%

Source: videotape data

Patient characteristics collected in the study included patient gender and patient age. These demographics were no different for each type of consultation (Table 4.6). There was a significantly higher number of new medications prescribed during precepting consultations and more of the parallel consultations tended to have been recorded in winter. These characteristics were considered as possible confounding factors in the analysis below.

Table 4.6 Patient characteristics in study consultations

	Solo consultation	Precepting consultation	Parallel consultation	Significance
Patient gender female	154 (59.9%)	71 (53.4%)	80 (60.2%)	p=0.857
Mean patient age	46 (SD 22.8)	46.2 (SD 24.0)	46.4 (SD 23.7)	p=0.863
Mean number of new medications prescribed	0.17 (SD 0.37)	0.44 (SD 0.77)	0.28 (SD 0.53)	p=0.010*
Consultations occurring in winter	79 (30.7%)	40 (30.1%)	80 (41.4%)	p=0.054
Source: videotape data				

Finally the PRCC student characteristics of precepting consultations were considered. The mean age of students was 29 years 7 months (SD 5 years 10months), reflecting the graduate entry nature of the course. Female students participated in 73% of the consultations (Table 4.7). The majority of the time, students were rated by their GP preceptors on the day to be competent or highly competent when compared with their peers. Precepting consultations in this study were evenly spread throughout the academic year. Again, these characteristics were considered as possible confounding factors in the analysis below.

Table 4.7 Student characteristics in precepting consultations

Student characteristics		frequencies	percentages
Gender	male	26	27.10%
	female	96	72.90%
GP rating of student	highly competent	56	42.10%
	competent	54	40.60%
	borderline	6	4.50%
	incompetent	4	3%
	unsure	13	9.80%
Time of year	Beginning of academic year	41	30.8%
	Middle of academic year	40	30.1%
	End of academic year	52	39.1%
Source: videotape data			

4.4 Consultation length

In this study consultation length was considered both in terms of objective measurement and also experienced duration.

4.4.1 Measured consultation length

The distribution of the principal dependent variable, consultation time, was examined for normality as a whole (Figure 4.1) and then divided by the independent variable: consultation type (Table 4.8).

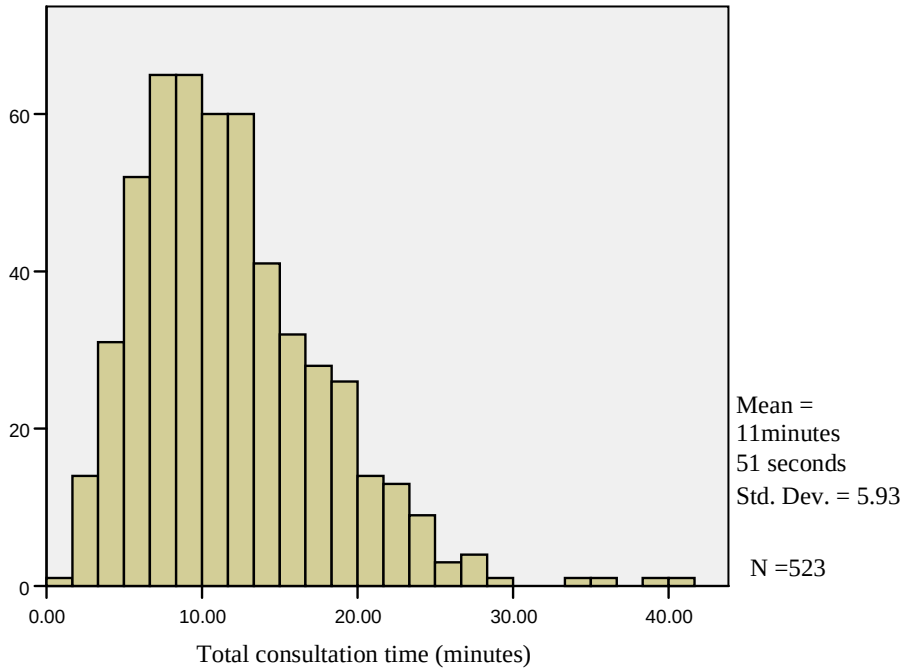

Figure 4.1 Distribution of consultation times

All the consultation groups violated the assumptions of normality, as the significance of the Shapiro-Wilk test was less than 0.05 and the skewness did not approximate zero. The positive skewness value indicated times clustered to the left hand side of the graph with the median less than the mean. Pallant[148] quotes Tabachnick and Fidell (2007) who argue that skewness will not make a substantial difference to analysis with reasonably large samples such as this. Positive kurtosis can result in underestimates of the variance, but this risk can be reduced with a large sample.[148] Parametric tests are therefore not unreasonable despite the significant Shapiro-Wilk test.

As seen in Figure 4.1 there are several data points sitting beyond 30 minutes on their own. The 5% trimmed mean, 11 minutes 31 seconds, is very similar to the mean,11 minutes 52 seconds, so these cases have been retained in the analysis.

Table 4.8 Tests for normality (Shapiro – Wilk) and skewness of consultation times

Consultation type	S-W statistic	df	Sig	Skewness	St. error of skewness	Kurtosis	St. Error
Solo	0.927	257	0.000	1.253	0.152	2.802	0.303
Precepting	0.956	133	0.000	0.796	0.21	1.204	0.417
Parallel	0.946	133	0.000	0.835	0.21	0.34	0.417
Source: Videotape data							

The mean length of solo consultations was 12 minutes and 11 seconds with a 95% confidence interval of 11 minutes 25 seconds to 12 minutes 57 seconds. The mean length of precepting consultations was 11 minutes and 46 seconds (95% CI 10 minutes 45 seconds to 12 minutes 46 seconds), and the mean for parallel consultations was 11 minutes and 21 seconds (95% CI 10 minutes and 26 seconds to 12 minutes 16 seconds).

Regression analysis of consultations times taking into account all variables considered to be possible confounding factors in this study (Table 4.9) found only six variables to have greater than 15% effect. These were: number of consulting sessions per week; number of medical qualifications; GP having preschool children at home; and number of years precepting in the last five years; patient gender and number of new medications prescribed. In several sessions (5%) GPs reported that the video camera affected the way they conducted the consultation. Regression analysis confirmed that consultation length was not affected by this subjective perception (p=0.860).

Although patient age and GP gender were not found to have a greater than 15% effect on consultation length in this sample, these variables were included in the final

statistical analysis as it is well recognised in the literature that consultation length increases with patient age[149] and female gender of the doctor.[132]

Table 4.9 Confounding factors

GP age	Objective measure of rurality: RRMA class
GP gender	Time of the year
GP consulting sessions per week*	Winter
Number of qualifications*	Patient age
Years in rural practice	Patient gender*
Years in this practice	Number of new medications prescribed*
Hospital privileges	GP has preschool children at home*
Procedural GP	Dr went to school in a rural community
GP practises obstetrics	Years in rural practice
GP practises anaesthetics	Number of years precepting in the last five*
GP practises surgery	

*Asterix indicate variables having >15% effect on consultation length
GP = general practitioner; RRMA = rural, remote and metropolitan areas classification

Source: Videotape data

The relationships between consultation length and the confounding factors were investigated using a Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure data behaved with reasonable normality and linearity. The correlation coefficients are displayed in Table 4.10 and show that the coefficient of determination of "number of years precepting in the last five" and "number of new medications prescribed" is less than 1%, and there is little confidence in the accuracy of the correlation (significance greater than 0.05).

Consultation times tended to increase with increasing number of qualifications, including basic medical degree, first year of precepting and female patients. Consultation times tended to decrease with having preschool children at home, and increased number of GP consulting sessions per week.

Table 4.10 Correlation coefficients for consultation length and confounding variables

	Pearson Correlation r †	Coefficient of determination r^2	Significance
GP consulting sessions per week	-0.133	1.77%	0.002*
Total number of qualifications including basic medical degree	0.2	4.00%	<0.001*
††Number of years in the last 5 precepting	0.078	0.61%	0.076
First year precepting	0.120	1.44%	0.006*
Number of new medications prescribed	0.018	0.03%	0.674
Patient gender female	0.105	1.10%	0.016*
Preschool children at home	-0.137	1.88%	0.002*
Patient age	0.161	2.59%	<0.001*
GP gender female	0.145	2.10%	0.001*

† N= 523 for all variables
††not included in final analysis model

Source: post videotape questionnaire

Mixed model analysis of all data was used to account for clustering of consultation activities within doctors, as it was assumed that activities would be affected in a fixed way by the consulting style of any given doctor.

Table 4.11 Estimated marginal means of consultation length

Consultation type	EM Mean	Std. error	df	95%Confidence Interval		Sig
				Lower bound	Upper Bound	
solo	13.455	0.787	22.426	11.825	15.085	
precepting	12.795	0.863	31.231	11.036	14.554	0.274
parallel	12.408	0.851	22.426	10.67	14.15	0.081

Source: videotape data

In the final mixed model analysis (Table 4.11), when taking into account the confounding factors listed above, the estimated marginal mean times for these three consultation types were:

- Solo consultations 13 minutes 27 seconds (CI = 11 minutes 50 seconds to 14 minutes 9 seconds);
- Precepting consultations 12 minutes and 48seconds (CI = 11 minutes 2 seconds to 14 minutes 33 seconds);
- Parallel consultations 12 minutes and 24 seconds (CI 10minutes 40seconds to 14 minutes 9 seconds).

This analysis showed there was no significant difference between estimated marginal mean (EMM) for solo and precepting consultation length ($p = 0.274$); or between solo and parallel consultation length ($p = 0.081$) using the parallel consulting model of supervision. These findings were compared with the interview data.

4.4.2 Perceived time

During interviews, participants were asked to describe a usual day precepting, or their impression of the experience of GP preceptors. The participants were not prompted regarding time if they did not mention it spontaneously. Twenty five of the thirty four interview participants mentioned the time taken when precepting (Table 4.12).

Table 4.12 Perceptions of consultation time

Perception of consultation time with a student	Participants
Less time - time for paperwork	(GPp21)
No change in time. Swap patient time for teaching time	(GPa11, GPa17, S1)
More time early in the year. Reduced to equivalent time by the end of the year	(GPp8, GPp15, GPp25, GPp31, GPp32)
More time	(GPp2, GPp3, GPp5, PM6, PM7, GPa10, GPa12, GPp14, PM16, GPn18, GPp19, GPn20, PM23, GPp26, S7, S9)
Source: interview data	

The majority of respondents spontaneously mentioning time, claimed precepting took longer and that this resulted in an increased length of day unless compensatory measures where taken. The majority of these doctors did not define how much more time. One doctor reported an additional hour per half day session (GPp31) while the majority described the time commitment as only "a little longer" (GPp3, GPp5, GPp14). The most common theme described in this study of more time taken, is in stark contrast with the objective findings which demonstrated that consultation times did not increase when precepting

There was a small group of respondents who stated that consultations did not take more time when precepting (GPp21, S1, GPa11, GPa17). Interestingly GPp21 and S1 worked together frequently. GPa11 and GPa17 were asked to participate in this study because of their considerable commitment to training. Their practices were set up in such a way that they rarely had a session without supervising either a student or junior doctor. This finding raised the question as to whether or not effective teaching behaviours took time or whether expert preceptors have developed efficient teaching techniques which allow them to fulfil the students learning agenda without forfeiting time.

4.4.3 Effective teaching and learning behaviours

The sample of precepting consultations was examined specifically to evaluate the student and preceptor variables which could impact on precepting consultation times. Firstly the GP teaching behaviours were considered (Table 4.13).

Table 4.13 GP teaching behaviours affecting precepting consultation times

Teaching characteristics	Pearson Correlation r †	Coefficient of determination r^2	Significance
Student reported GP frequently involved them actively in consultation	-0.203	4.12%	0.019
Student reported GP frequently demonstrated clinical and professional competence	0.073	0.53%	0.046
Student reported GP frequently fostered a supportive interpersonal relationship	0.143	2.04%	0.102
Student reported GP frequently used an organised approach including goal setting and summarisation	-0.073	0.53%	0.104
Student reported GP frequently provided feedback regarding their clinical performance	0.111	1.23%	0.113
Student reported GP frequently balanced clinical and teaching responsibilities	0.183	3.35%	0.138
Student reported GP frequently emphasised problem solving	-0.011	0.01%	0.282

† N= 266 for all variables
Source: student post videotape questionnaire

Only two of the student-reported effective teaching behaviours were found to have a statistically significant effect on precepting consultation times using multi-regression analysis. These consisted of actively involving students in the consultations and demonstrating clinical and professional competence. Actively involving students in consultations reduced consultation length ($p = 0.019$). This finding challenges the perspectives of many of the interview participants who described limiting the role of students when they felt time pressured (GPa1, GPa11, GPa17, GPp22, GPp32);

however the practical significance of this finding in this study was minimal as only one of GP preceptors in this study was reported to rarely involve students actively in consultations (GPp25). When students reported frequent demonstration of clinical and professional competence, precepting consultations were found to be very slightly longer ($p = 0.046$). Again the practical significance of this finding in the study was minimal, as this would amount to three seconds in a ten minute consultation.

Most interestingly, there was no increase in precepting consultation times when GP preceptors were reported to frequently emphasise problem solving, use an organised approach including goal setting, or give feedback. This suggests that it is not time constraints which limit the frequency of these effective teaching activities when precepting.

Secondly, the GPs' perception of student competence in comparison with their peers, was considered as a possible confounder for precepting consultation time (Table 4.14).

Table 4.14 Estimated marginal means of precepting consultations by student competence

Student concerns	EM Mean	Std. error	df	95%Confidence Interval		Sig
				Lower bound	Upper Bound	
Yes – incompetent, borderline or unsure	13.182	1.770	74.21	9.655	16.708	
No – competent or highly competent	12.086	1.032	23.09	9.951	14.221	<0.001

Source: post video survey and videotape data

This analysis clearly demonstrated that estimated marginal mean for precepting consultations when GPs had no concerns regarding their student competence at 12 minutes and 5 seconds (CI = 9 minutes 39 seconds to 16 minutes 42 seconds) was significantly shorter ($p < 0.001$) than precepting consultation length, when GPs expressed concerns about the competence of their students in comparison with their peers (13 minutes 11 seconds; CI = 9 minutes 57 seconds to 14 minutes 13 seconds).

4.4.4 Year long attachments

When considering the student factors impacting on precepting consultation time the researcher was particularly interested to test the null hypothesis that length of student attachment does not affect precepting consultation length. Regression analysis confirmed that student gender and GP rating of student competence had greater than 15% effect on the consultation time when assessing the affect of "time of year" on consultation times. These variables were added to the mixed model linear analysis. Mixed model statistical analysis was performed using the following confounding factors: GP gender; preschool children living at home, number of consulting sessions per week; number of qualifications; years in the last five taking medical students; student assessment by GP; student gender; time in the academic year; patient gender and number of medications prescribed. In the final mixed model analysis (Table 4.15), when taking into account these confounding factors, the estimated marginal mean times were:

- Precepting consultations at the beginning of the academic year 11 minutes 10 seconds (CI = 8 minutes 19 seconds to 14 minutes 0 seconds)
- Precepting consultations in the middle of the academic year 13 minutes and

29 seconds (CI = 11 minutes 4 seconds to 15 minutes 54 seconds)

- Precepting consultations at the end of the academic year 12 minutes and 7 seconds (CI 9 minutes 31 seconds to 14 minutes 43 seconds).

This analysis demonstrated no significant difference between estimated marginal means of precepting consultations over the course of the academic year ($p = 0.119$ and $p = 0.511$).

Table 4.15 Effect of year long attachments on precepting consultation time

Consultation type	EM Mean	Std. error	df	95%Confidence Interval		Sig
				Lower bound	Upper Bound	
beginning of academic year	11.164	1.414	47.260	8.321	14.008	-
middle of academic year	13.482	1.184	30.126	11.065	15.899	0.119
end of academic year	12.121	1.287	40.885	9.522	14.721	0.511
Source: videotape data						

Despite this quantitative finding, five doctors (GPp8, GPp15, GPp25, GPp31, GPp32) described an initial increase in precepting consultation time which returned to equivalent to a solo appointments during the course of the year (Table 4.11). There was a diverse opinion about how quickly this return occurred, with some doctors describing it happening as early as four to six weeks while other described it occurred much late in the year.

> I am happier with the [PRCC] concept as it is. The students are here for a long time and you do build up a rapport with them. I haven't been really keen to do any student supervision for students that have been here for only two weeks …. Those kind of attachments haven't really appealed to me at all, because that is giving of your time with no real return. When the students are here longer you really feel that you are contributing to their education. It is much more consuming of your time to have someone there for a short period (GPp31).

In summary the quantitative data found that GP consultation time did not increase

using the parallel consulting model. Effective teaching behaviours did not increase precepting consultation time and there was no significant difference in precepting consultation times over the course of the academic year. Perceptions of time spent precepting were more complex however. This is discussed further in Chapter 6.

4.5 Non-consulting time in a session

If GP consultation length did not increase when precepting medical students, it may have been that GPs took additional time between consultations to teach students. Therefore the null hypothesis that non-consulting time during the session did not increase, was tested. Non-consulting time during a session was defined as all time between the start of the first consultation in the session to the completion of the last consultation of the session where a doctor was not directly in contact with a patient. This definition excluded time before the first consultation and after the last consultation and therefore would not measure preparation time or deferred activities. However, it was considered a more reliable measure of consulting session time than trying to determine when GPs started and stopped work.

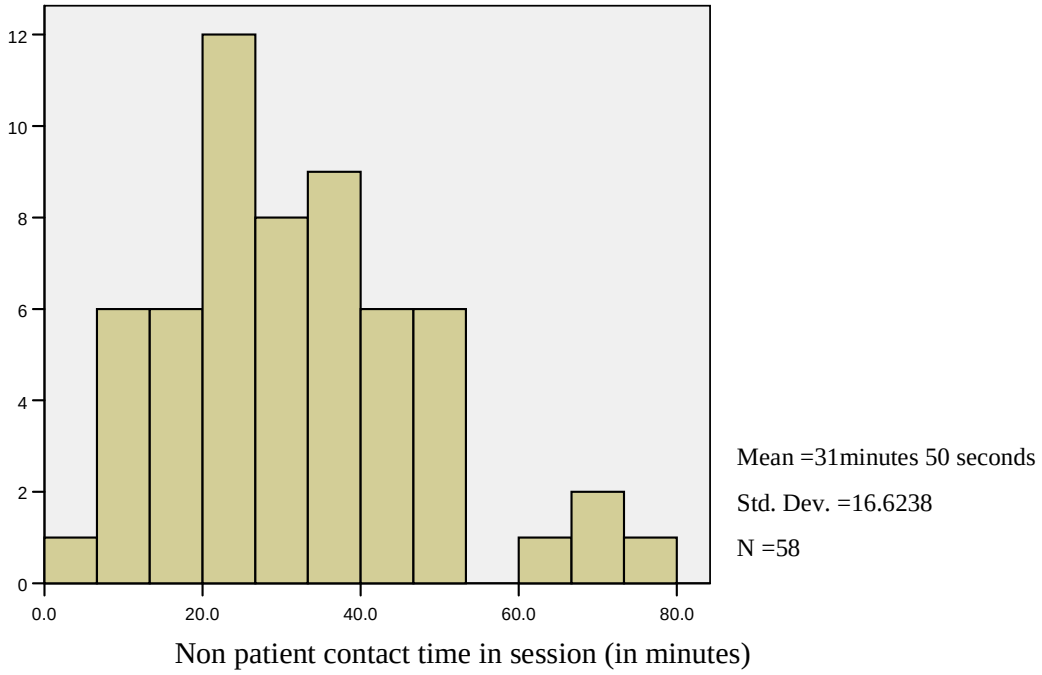

Figure 4.2 Distribution of total non-consulting time in a session

Non-consulting time per session was examined for normality as a whole (Figure 4.2), and then divided by the independent variable, session type, (Table 4.16) to further assess normality and skewness.

Table 4.16 Tests for normality and skewness for non-consulting time

Session type	S-W statistic	df	Significance	Skewness	St. error of skewness	Kurtosis	St. Error
Solo session	0.937	29	0.082	0.921	0.434	0.627	0.845
Precepting session	0.96	29	0.337	0.669	0.434	0.398	0.845
Source: videotape data							

In this case both, samples can be assumed to have normal distribution despite the slight positive skewness and kurtosis of the distribution by the Shapiro-Wilk test.

Mixed model statistical analysis was performed, accounting for the following confounding factors: GP gender, preschool children living at home, number of qualifications, number of consulting sessions per week and years taking medical students in the last five (Table 4.17).

Table 4.17 Estimated marginal means for non-consulting time in a session

Session type	Mean	St. error	df	95%Confidence Interval		Sig
				Lower bound	Upper Bound	
solo session	36.713	3.889	24.207	28.691	44.735	0.093
precepting session	41.923	3.889	24.207	33.901	49.945	

Source: videotape data

The estimated marginal mean of time spent in non-consulting activities in a half day session was 36 minutes 43 seconds compared with 41 minutes and 55 seconds for precepting sessions. This difference was not statistically significant ($p = 0.093$) and demonstrates that there was no practical difference in non-consulting time within the session.

4.6 Perceived additional time

The videotape analysis found no significant difference in consultation length or non-consulting time when precepting. In contrast, the majority of GPs considered precepting to be more time consuming than solo consulting. One plausible

explanation for this contradiction is that there was additional time spent when precepting students which was not accounted for in the quantitative study, because this time occurred either before the first consultation or after the last consultation. Results required to consider this hypothesis were considered in the section below.

4.6.1 Beginning of the day

Several GPs described trying harder to start their consulting session on time when precepting a student (GPp3, GPa12, GPp27). Some doctors stated that they did this as they were mindful of catching up with the student, while others reported they wanted to minimise their feelings of time pressure (GPp3, GPa12). Commencing the session on time reduced the time available to see inpatients in the ward with students (GPp27). Preparation time before the session was used to follow up urgent results before the student arrived (GPp14, GPp22). There was a general sense of transferring some clerical and other duties to the beginning of the day; however, there was no indication that the day commenced significantly earlier (GPp3).

4.6.2 End of the day

GPs described some additional work at the end of a precepting session (GPa11, GPa12, GPp13, GPa17, GPn18, GPp21, GPp24). This time was reportedly used to finish off without the student (GPa17), complete a bit more paperwork (GPa12, GPp18), or more frequently to debrief the student (GPa12, GPp21, GPp24, GPp31, S9). A few GPs described booking one or two fewer consultations at the end of the day to compensate for running late when precepting (GPp13). Time pressure during the consulting session was also reduced by ensuring child care arrangements allowed

GPs to finish late (GPa11). Again there was a general sense of transferring some clerical and other duties to the end of the day; however, there was no indication that the day was extended excessively for the majority of GPs.

> If I talk to the students afterwards I still have to do the paperwork, I don't know if it [precepting] reduces it [paperwork]. Sometimes it actually clears your head. I always end up with lots of paperwork at the end of the session anyway. The amount probably is a bit more (GPn18).

4.7 Summary

The results presented in this chapter demonstrated that perceptions of the time committed by GPs when they precepted medical students was not supported by the objective data from videotaped consulting sessions. While the videotape analysis found no significant difference in consultation length or non-consulting time when precepting, the majority of GPs considered precepting to be more time consuming than solo consulting, and this experience was confirmed by student and practice manager reports. These findings emphasise a weakness of self reporting questionnaires.

The possibility that GPs had accurately assessed the time commitment and that the quantitative study failed to account for the additional time taken before the first consultation and after the last consultation in any session was considered. This proposition was found to be unlikely.

5 GP ACTIVITIES DURING PRECEPTING

5.1 Introduction

In this chapter, the differences in clinical activities in which the GPs engaged when precepting students, as compared with consulting alone, are described. These differences are then examined to determine whether the changes in activities could affect GPs' experience or memory of duration of consulting.

First, GP activities during solo, precepting and parallel consultations were analysed and compared. Second, non-consulting activities in precepting and solo consulting sessions were compared. This information provided an objective measure of the changes that occurred to the working day of GPs when precepting medical students, using the parallel consulting model. Finally, the objective findings were triangulated using the interview data to build a picture of how and why activities changed during precepting.

5.2 Consultation activities

Consultations were analysed in 15 second intervals by a single research assistant and coded for the most frequent activity in the preceding 15 seconds, using the modified Davis Observation Code. The coding was audited by the primary author, with an inter-observer reliability of greater than 96% between coder and auditor. Estimated marginal means were calculated taking into account confounding factors known to affect consultation length (Table 5.1).

Table 5.1 Consultation activities for GP preceptors

Type of consultation	Est Marginal Mean m=minutes s=seconds	95% Confidence Interval		stat sig
		Lower Bound	Upper Bound	
INTRO				
solo	57s	43s	1m11s	
parallel	1m12s	56s	1.47	0.047*
precepting	1m4s	47s	1m21s	0.338
HISTORY				
solo	2m38s	2m8s	3m8s	
parallel	2m37s	2m5s	3m8s	0.916
precepting	3m17s	2m44s	3m49s	0.002*
EXAMINATION				
solo	1m44s	1m23s	2m7s	
parallel	1m41s	1m16s	2m5s	0.729
precepting	1m7s	42s	1m32s	0.001*
MANAGEMENT				
solo	4m15s	3m49s	4m41s	
parallel	3m58s	3m28s	4m28s	0.255
precepting	3m34s	3m2s	4m5s	0.007*
HEALTH PROMOTION				
solo	17s	7s	28s	
parallel	14s	2s	25s	0.279
precepting	13s	2s	24s	0.193
CLERICAL				
solo	3m14s	2m33s	3m55s	
parallel	2m20s	1m37s	3m4s	0.001*
precepting	1m43s	59s	2m28s	< 0.001*
TEACHING				
solo	0s	0s	8s	
parallel	2s	0s	14s	0.327
precepting	1m8s	56s	1m20s	< 0.001*
RESEARCH RELATED				
solo	3s	1s	5s	
parallel	5s	2s	7s	0.086
precepting	1s	0s	3s	0.076
UNRECORDED				
solo	5s	0	21s	
parallel	3s	0	21s	0.817
precepting	26s	6s	46s	0.017*
Source: videotape data				

When compared with solo consultations, in precepting consultations (Table 5.1) GPs spent 1 minute 8 seconds teaching students ($p<0.001$) and 39 seconds extra taking a

history from the student and patient (p=0.002). There were 21 seconds of additional unrecorded activity (p=0.017). The GPs spent an average 37 seconds less time examining patients (p=0.001), 41 seconds less time on patient management (p=0.007), and 1 minute 31 seconds less performing clerical and other activities (p=0.000).

Parallel consultations were similar to solo consultations with the exception that GPs spent 16 seconds more in introduction activities (p=0.047) and 53 seconds less in clerical and other activities (p=0.001).

Two of the solo consultations and 13 of the parallel consultations had teaching time coded. The majority of this time was not direct face-to-face teaching, but discussion with the student on the telephone, when the student had telephoned the GP to prompt them to join the precepting consultation, or with a question. In precepting sessions, some of the GPs preferred not to interrupt the student by joining the precepting consultation after a single parallel consultation. They continued seeing patients in parallel until the student let them know they were ready for the GP to join the precepting consultation. On other occasions, GP preceptors were delayed joining the precepting consultation despite seeing only one patient, and were prompted by the student. GPs were telephoned by students in more than 13 parallel consultations but this was not recorded where the conversation was not the most common activity in any fifteen second coding interval.

A recognised weakness of the modified Davis Observation code was that each 15 second time interval was coded for a single GP activity. It is possible that some

activities which occurred for less than eight seconds in any time period were under-represented in the results. However, coding validity was improved by the large sample of 523 complete consultations averaging over 11 minutes, resulting in the collection of more than 23,000 fifteen second coded units of GP activity.

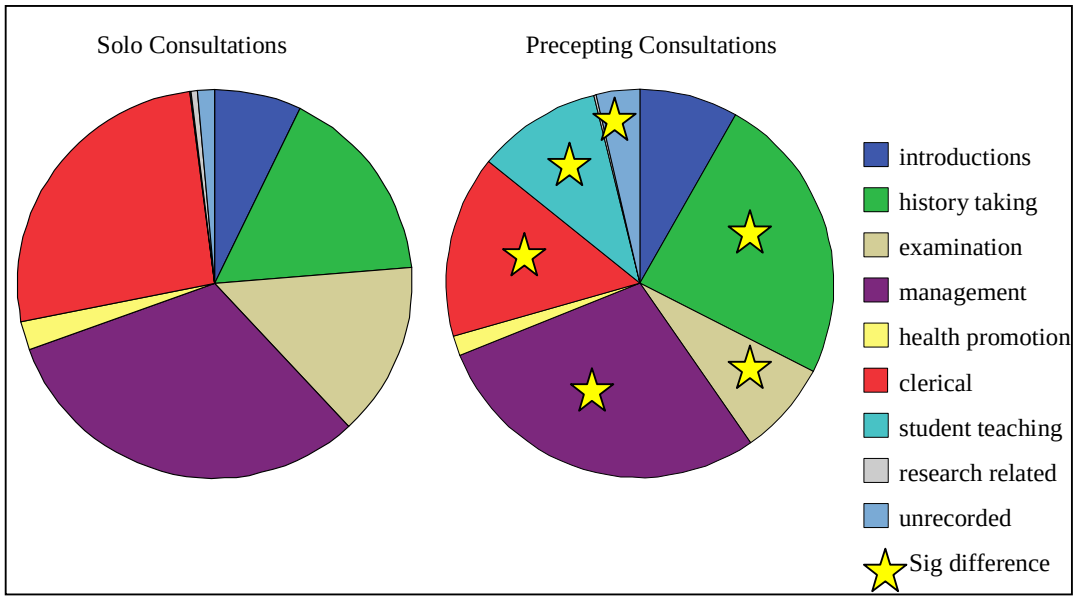

Figure 5.1 Consultation activities in solo and precepting consultations

During precepting consultations, six of the nine activities recorded were significantly different statistically, when compared with solo consultations (Figure 5.1). The changes to each of the activities recorded is considered below.

5.2.1 Introductions

The time taken in introductions did not change significantly between solo and precepting consultations, however, GPs described working to gain patient rapport, ensure patient consent to commence the three-way consultation, and then worked to

transfer the attention of the patient back to the student (GPp27, GPp29, GPp33).

> I certainly try and have my initial social interaction and then they start to tell you about the complaint I tend to try at some point make a break and say "[student name] what do you think is going on? What have you done? What do you think we should do?" Otherwise it is too easy for them [the student] (GPp33).

5.2.2 History

During precepting consultations, GPs took 39 seconds extra taking a history from the student and patient (p=0.002). Students were encouraged to present the history while the GP listened (GPa11, S3, GPp13, GPp22, GPp27, GPp31, GPp33). Some GPs preferred this to be a formal presentation, while others preferred the presentation to be in terms patients would understand (S3). The history taking process was felt to take longer, due to the complexity of having to unpack the student report, clarify or ask further questions of the student or patient and then resynthesise the student's clinical reasoning (GPa1, GPa11, GPa17, GPp33). This process was considered difficult by some and required the doctor to be receptive to both the student and the patient (GPp15, GPn30).

> I always felt it was important to give the student time to present what they had found. Sometimes I would know the patient well, and know exactly why they had come, and it actually made it easier to direct the student's presentation.……But sometimes you would go in there and it might be a patient that wasn't well known to me, or a new patient, and then it would have to be a more typical case of the student presenting what they had found. Sometimes you would have to direct that because there would be this time restraint hanging over you…… The short time that you were going to be in there and you wanted at least time to listen to the student presentation and feel that you were giving the patient time as well, because they had booked in to see you in the first place (GPp33).

5.2.3 Examination

GPs spent an average 37 seconds less time examining patients (p=0.001) during precepting consultations. Despite this, many GPs reported taking longer with patient examination because they felt the need to duplicate the examination (GPp22, GPp26, GPp27, GPp32). GPs described that once they were comfortable that they could accept the students' findings, they would only duplicate strategic parts of the examination where physical findings were critical for the exclusion or confirmation of serious diagnoses (GPp32). This occurred with short term students in their final clinical year (GPa11, GPa12). Confidence in students' examination skills took time to develop in the PRCC students (GPp31, GPp32). Despite this, there was no significant change in the examination time in precepting consultations over the course of the year (p = 0.608)

> The difference in how quickly you could trust a student's examination was related to your assessment of how competent they were and that assessment develops quite quickly, but because these students start off as pre-clinical their competence develops at different rates. It takes a fair few weeks to decide whether you could trust a student or not (GPp31).

Despite some GP reports to the contrary, the video analysis demonstrated that GPs frequently accepted the students' assessments when they reported no abnormalities on physical examination, but tended to check positive signs reported by the students. This finding has important implications for patient safety which is the primary responsibility of the GP preceptor. This finding also helps to explain why consultation time lengthens when GPs are unfamiliar with a students' performance or assess that students are less competent than their peers (p <0.001).

5.2.4 Management

GPs spent an average of 41 seconds less time on patient management (p=0.007) during precepting consultations. GPs described spending time discussing the differential diagnosis with students and developing a management plan together (GPa12, GPp33). The reduction in management time in precepting consultations was in part due to doctors delegating the management roles to students while they observed or performed other activities (usually clerical) during the consultation (GPp26, GPp27). They expected students to be closer to the mark with diagnoses by the end of the year and believed patients gained from increased explanation in the consultation (GPp2, GPp25). Students believed they participated more when they had more knowledge about a patient's condition (S9).

5.2.5 Health promotion

The time taken in health promotion activities other than those relating to the presenting problem were limited and did not change significantly in precepting consultations. There were few comments made regarding health promotion. A few doctors proposed that students were good at following protocols and computerised prompts thereby increasing patients access to preventative care (GPp5). The reverse sentiment was also expressed as GPs felt that time pressure reduced health promotion opportunities (GPp29).

> More of the consultation is taken up so therefore you may not be able to get into preventative care as much. So the outcome for the patient is less then, for their time commitment (GPp29).

5.2.6 Clerical and other activities

Clerical and other activities were reduced by GPs by an average of 53 seconds ($p=0.001$). This was in part due to students anticipating and contributing to clerical tasks, for example, writing up the notes and preparing investigation request forms (GPn18). Doctors delegated some tasks (S3). Doctors described limiting interruptions and practice staff confirmed they were less likely to interrupt GPs when they had a student as they were aware that GPs appeared to be time pressured (GPp2, PM6, PM7, GPa12, GPa17). GPs also reported deferring clerical tasks during the consultation (GPa12, GPn18).

5.2.7 Teaching

GPs describe teaching students directly during the precepting consultation (GPp3, PM6, GPp8, GPp9, GPa11, GPa19, GPp21, GPp33). Teaching was observed to take over a minute per consultation ($p<0.001$). GPs claimed students benefited from being orientated to the factors contributing to management decisions and patients benefited from the detailed description of conditions (GPp3, GPp8, GPp9, GPp14, GPa17). GPs worked to draw out details of the differential diagnosis and management from students (GPp2, GPa12, GPp33, S3, S9). Sometimes this involved sitting back and letting the student go down a blind alley which doctors sometimes found frustrating because of their time constraints (GPa1). GP preceptors had the impression that they swapped patient time for teaching time (GPa11).

There was no significant change in the teaching time over the course of the year (p = 0.511); however, the content of teaching changed over the course of the year (GPp31).

> I don't think how much the students have progressed would make much difference with the time. You might spend the time with them differently, for example going beyond the basics of history taking, examination techniques, but looking more about how they could improve other consulting skills like how to build up rapport with the patient, body language, putting different ideas across to the patient, things that are extensions of consultation that go beyond normal history taking, examination and management. So time-wise it wouldn't make any difference. I would just spend the time differently (GPp31).

5.2.8 Unrecorded time

Increased unrecorded time in precepting consultations (21 seconds) occurred because the GP spent more time out of camera while in the student's room, making it more difficult to evaluate his/her activities. This time often occurred when the student was actively engaged with the patient and so may indicate time spent actively observing student performance. If this time was spent doing clerical work, there would still be a significant reduction in time spent by the GP engaged in clerical and other activities compared with lone consultations.

5.2.8 Parallel consultations

The only practical difference between lone consultations and parallel consultations was the GPs' recognition that patients and students were consulting in parallel and would soon need the GPs to join them. GPs described time pressure being magnified when they were aware a student and patient may be waiting for them (GPa12, GPp13, GPp25, GPp33). They made more of an effort to run on time (GPp5) but

they did not feel their consulting activities changed (GPp15). They reported occasionally taking short cuts to finish a consultation (GPp13) and worked to avoid interruptions (GPp14). These data are consistent with the objective finding that clerical and other activities were reduced by an average of 53 seconds in parallel consultations compared with solo consultations ($p = 0.001$). GPs did not seem to be aware of the small increase (16 seconds) in introduction time during parallel consultations ($p = 0.047$). From the videotape observations, this time was related to GPs returning to their consulting rooms following completion of a precepting consultation. They tended to bring their patients into the rooms before opening the patients' computer records and collecting their thoughts and then spend more time discussing what was to be accomplished in the consultation.

5.3 Non-consulting activities

Non-consulting times on the videotape were analysed in 15 second intervals by a single research assistant and coded for the most frequent activity using the coding system developed in the pilot study (Table 3.2). The coding was audited by the primary author with <2% variance between coder and auditor indicating a high level of instrumentation reliability. These data were combined with the non-consulting data coded in real-time during observation of the GPs when they left the consulting room. Estimated marginal means were calculated using mixed method analysis taking into account confounding factors known to affect total non-consulting time (Table 4.15). These results are found in Table 5.2.

Table 5.2 Non-consulting activities for GP preceptors

Type of consultation	Est Marginal Mean m=minutes s=seconds	95% Confidence Interval		Significance
		Lower Bound	Upper Bound	
PERSONAL ORGANISATION TIME				
solo session	1m19s	0s	2m51s	
precepting session	1m32s	0s	3m4s	0.794
PERSONAL INTERACTION TIME				
solo session	2m59s	27s	5m31s	
precepting session	4m	1m28s	6m32s	0.454
PATIENT RELATED ORGANISATION TIME				
solo session	30m8s	21m44s	38.697	0.077
precepting session	24m45s	16m11s	33m19s	
PATIENT RELATED INTERACTION TIME				
solo session	13s	0s	35s	
precepting session	25s	3s	47s	0.259
PROFESSIONAL ORGANISATION TIME				
solo session	1m10s	0s	2m50s	
precepting session	1m33s	0s	3m12s	0.664
PROFESSIONAL INTERACTION TIME				
solo session	0s	0s	11s	0.033*
precepting session	13s	10s	24s	
STUDENT ORGANISATION TIME				
solo session	13s	0s	6m13s	0.002*
precepting session	59s	0s	7m58s	
STUDENT INTERACTION TIME				
solo session	0s	0s	1.949	<0.001*
precepting session	6m30s	4m20s	8m39s	
RESEARCH ORGANISATION TIME				
solo session	35s	10s	1m0s	0.472
precepting session	26s	0s	51s	
RESEARCH INTERACTION TIME				
solo session	7s	0s	38s	0.110
precepting session	34s	3s	1m4s	
Source: aggregated videotape and direct observation data				

GP preceptors spent an additional 13 seconds (p = 0.033) engaged in informal discussions with colleagues or clinic staff regarding clinical or broader professional matters in a half day consulting session, and an additional 46 seconds organising students (p = 0.002). These, however, were not practically significant increases as professional interaction only occurred in six of 58 consulting sessions and both

increases were less than one minute. Of more practical significance was the additional 6 minute 30 seconds spent interacting with students ($p < 0.001$). No student interaction or student organisation times were coded in the solo sessions; however, the upper bound of the estimate marginal means was above zero as a result of the mathematical effect of the confounding factors included in the analysis.

Comparing the quantitative findings above with the data from interview participants the findings are similar. Non-consulting time use reportedly changed during precepting sessions. GPs described spending time debriefing students or speaking more generally about their approach to medicine for up to several minutes between patients (GPa10, GPa12, GPa17, GPp19, GPp22, GPp24, GPp31). This corresponds with, but could be an overestimation of, the more than 7 minutes per session spent interacting with and organizing students. GPs also reported having to run back and forwards between their own consulting rooms and the students' consulting rooms (GPp3, PM 23, GPp24). It is likely this increased the opportunity for GP preceptors to interact with their colleagues and clinic staff. One doctor claimed his non-consulting activities did not change as he had no time between consultations; however, more GPs described reducing the amount of paperwork and other interruptions during the session (GPp14).

5.4 Summary

When precepting consultations were compared with solo consultations, GPs spent an average of 39 seconds extra taking a history. 37 seconds less time examining patients, 41 seconds less time on patient management, 1 minute 31 seconds less

performing clerical and other activities, 1 minute 8 seconds teaching students and 21 seconds more on unrecorded activity. Parallel consultations were similar to solo consultations, with the exception that GPs spent 16 seconds more in introduction activities and 53 seconds less in clerical and other activities. Interview participants described that their role in the consultation changed, as they actively delegated or deferred clinical activities to compensate for time taken to give students an opportunity to learn.

This chapter has clearly described the quantifiable changes in consultation activities of GP preceptors. There is a sense from the majority of GPs that the process of precepting increased the complexity of the activities they did as they juggled the needs of the student and the patient. This may have increased feelings of time pressure associated with consulting. Time pressure is explored in Chapter Six.

6 TIME PRESSURE

6.1 Introduction

In this chapter, the participants' experiences of time pressure as the cost of precepting are explored, and the complex adaptive interactions which occurred as a result of the time pressure felt by GP preceptors are described.

6.2 Experiences of time pressure

Several themes were identified in the study relating to time pressure (Table 6.1) . These themes defined GPs' experiences of time pressure and are described below.

Table 6.1 Experience of time pressure

GPs descriptions of time pressure	Participants
Competing priorities	GPp2, GPp3, GPp8, GPa17, GPn20, GPp25, GPp26, GPp28, GPp31
Mental effort	GPp2, GPa12, PM23, GPn20, GPp25, GPn30, GPp31
Increased pressure of precepting	GPp2, GPp3, GPa11, GPa12, GPp13, GPp14, GPp15, PM16, GPa17, GPn18, GPn20, GPp22, PM23, GPp24, GPp25, GPp26, GPp27, GPp29, GPn30, GPp31, GPp32
Source: interview data	

6.3 Competing priorities for general practitioners

The GPs described being overwhelmed by competing responsibilities which they worked to juggle (GPp2, GPp3, GPp8, GPa17, GPn20, GPp25, GPp26, GPp28, GPp31). These occured within an individual consultation (GPp2), within a

consulting session such as seeing several patients at once, attending to staff questions and assisting other doctors asking for help (GPp17a). They also occurred within their roles as clinicians, such as completing paperwork, carrying out hospital procedural responsibilities, organising student and registrar training (GPp8, GPn20, GPp26, GPp28) and in other aspects of their work such as attending Division, and national committees (GPp25). Finally they occurred in their personal lives particularly for those with young children (GPp2, GPp33).

6.4 Mental effort

GPs worked to balance the needs of the student and the patient. This created tension particularly as patient discomfort often occurred in situations which were considered the most authentic learning situations for students (GPp3). Tensions could result in feelings of guilt (GPp28).

GPs described the mental energy of orchestrating the consultation, to ensure the agenda of patients (health care) and students (learning) were met (GPp2, GPa12, PM23, GPn20, GPp25, GPn30, GPp31).

> If I had a student sit in I would be thinking with the other half of my mind about bringing out interesting things or making it more of a training time for the student. So the quality of care to my patient might be affected if I have two people in the consult whose needs I try to meet (GPn20).

They also described feeling more aware of tracking the student's' activities during the session to ensure they were meaningfully engaged (GPa12, PM23).

> There is a mental energy involved in having a student to relate to and to be conversing with and I suppose another body you need to be aware of. You need to be aware of where the student is and who he (sic) is actually seeing

> and when did I last leave him (sic) there. So there is the mental energy in organising the logistics (GPa12).

6.5 Increased pressure of precepting

GPs described feeling significant time pressure associated with precepting medical students (GPp2, GPp3, GPa11, GPa12, GPp13, GPp14, GPp15, PM16, GPa17, GPn18, GPn20, GPp22, PM23, GPp24, GPp25, GPp26, GPp27, GPp29, GPn30, GPp31, GPp32). This was described in very strong terms including *hate* (GPp3), *nightmare* (GPp31) and *angry at myself* (GPp24). Time pressure was increased as GPs found it harder to keep to time when precepting (GPp2, GPp3, PM4, GPa12, GPp13, GPp14, GPa17, PM23).

GPs felt pressured for time when precepting as they perceived they were likely to run late, hence increasing patient waiting times (GPp3, PM6, GPp13, GPp33, S3, S9). This increased their own stress (GPp3, GPn20, GPp24). They could choose to reduce patient waiting times by reducing the number of appointments available. However, this affected patients' access to appointments (GPp2, PM6, GPp15, GPp26).

> When I run late it makes me feel bad, it makes me worry about my patient's reactions when they are sitting in the waiting room a long time and I just know it takes longer. It is about the effect it has on me and my patients (GPp3).

6.4.1 GPs immediate response to time pressure

GPs described responding immediately to increased time pressure (Table 6.1). They worked to avoid interruptions (GPp14), deferred tasks particularly paperwork (GPp14, GPa17) or curtailed consultation activities so they were less likely to have extended consultations (GPp2). GPs described consciously allocating time to

activities and defining the limits of the consultation at the beginning of an interaction (GPa1, GPa17). Despite this they perceived they rushed some tasks (GPp14, GPp27).

Table 6.2 GPs immediate response to time pressure when precepting

GPs immediate response to time pressure when precepting	Participants
Avoided interruptions	GPp14
Deferred tasks	GPp2,GPp14,GPa17
Delegated tasks	GPp2,GPp14,GPa17
Rushed	GPp14,GPp27
Consciously allocated time	GPa1,GPa17
Reduce students' active role	GPa1, GPa11, GPp22
Bulk billed patients	GPp27
Source: Interview data	

Time pressure meant GP preceptors felt frustrated when students were thought to be inefficient and they were more likely to delegate them to a passive-observer role (GPa17, GPp32). Some GPs felt believed students interrupted them (GPp22). Less advanced students or students considered less competent were given roles of passive observation only (GPa11, GPa17, GPp32). If students were trusted to fulfill a consultation duty, GPs described delegating tasks (GPp2, GPp14, GPa17).

> I am guilty of taking over because of the time pressure and I would regard that as poor really. But it happens more often than I would like and clearly it would happen more at the start of the year than at the end. But I regard that as a negative aspect of teaching consultations. It adds to the pressure on time (GPp32).

One GP described not charging his patients an additional payment above the government funded payment “to train them not to be too over-demanding” (GPp27). His reasoning seemed to be that patients would not feel the need to use the full

fifteen minute allocation of time if they were not charged for the time. It was described that GPs did not think they were rushed because they or the practice had adapted to the time pressures (GPp33).

6.4.2 GPs adaptations to time pressure

As GPs were aware that precepting increased their feeling of time pressure, they adapted their behaviour to limit the impact of this time pressure (Table 6.2).

Table 6.3 GPs adaptation to time pressure when precepting

GPs adaptation to time pressure when precepting	Participants
Reduced competing commitments	GPa11, GPp24
Developed time keeping skills	GPp31
Established student competence to allow task delegation	GPa1, GPp8, GPp31
Limited frequency of precepting	GPn20, GPp25, GPp28, GPp31, S1, S3, S5
Prioritised the time	GPa1, GPp2, GPa17, GPp26, S2
Source: interview data	

GP preceptors prioritised their precepting time by reducing competing commitments on precepting days, for example, by avoiding being on call when precepting and ensuring they were not responsible for picking up children (GPa1, GPp2, GPa11, GPa17, GPp24, GPp26). GPs were aware that time keeping skills varied between doctors but could be improved to reduce time pressure (GPn20, GPp31). GPs described uncertainty in delegating patient care activities in the consultation to students until they trusted them (GPp8, GPa11, GPp31).

> The students certainly get better at it in terms of their knowledge of the patient, their history taking skills and their capacity to take responsibility. When a patient needed a letter to a doctor or physio then [student name] was more than happy to actually write the letter. So as the year goes on, it makes

> it easier, for sure. You spend the same amount of time but I am not feeling the need to go back and check what they have done. And it makes the brain work easier because you know that they have covered the bases. (GPp26)

Sharing the responsibility for precepting throughout the clinic allowed GPs to limit the frequency of precepting to between once a week and once a month (GPn20, GPp25, GPp28, GPp31

6.4.3 General practice systems response to time pressure

Practice staff were very aware of the patient stress caused by patient waiting, and work to support patient flow (PM16, PM23). GP appointment schedules were changed by staff to lighten the patient load, either by allocating one less appointment per hour or by scheduling several appointments at the end of the day (PM 16, GPa12, GPp13, GPp19, GPp21). However, some doctors explained that the precepting roster was drawn up too late and they already had patients booked, or they had chosen not to alter their booking frequency due to the large patient load (GPp25, GPp26, GPp32, GPp33). They argued that reducing appointments would only extend their waiting list (GPp26).

> The frequency of consulting sessions is about right**.** I wouldn't want to do it every week because I am just feeling I am consulting way too much. What I mean is that if I see fewer patients on a particular consulting morning or afternoon with students then the amount of patients that you see both by yourself and with student together is less than what I would see by myself. Also in our system at the clinic, the patients booked in with the student are not always my patients so then my waiting list to see my own patients gets longer (GPp19).

Staff and students recognised the risk of doctors running late if they became too involved in teaching (GP23, GPp25, GPp32). Practice staff also worked to improve patient flow by minimising competing needs (GPp2, GPa12, GPa17). They were

involved in ensuring patient consent to involve a student prior to the patient commencing his/her appointment.

> Well I guess it does slow the whole day down a little. Staff have to continually say “Dr P has a student with him today do you mind?” or “Do you mind seeing the medical student first, then Dr P will complete the consultation?” There is a lot more expression in the reception area, when they greet the patients. And you have to be vigilant to try and keep them [the GP] moving so that they don't get too far behind because it is easy for both the supervisor and the medical student to get engrossed in what they are doing and let time slip by. It just happens (PM23).

6.4.4 Students response to time pressure

Students recognised that precepting took time (S2, S3, S5, S6, S7, S9). One student (S2) described a preceptor in terms of "being generous of his time" inferring that time was a gift which was valued. Students felt that they could get in the way and ask too many questions slowing GP consulting down (S5, S6). Students were mindful of the time they took and colluded to support the GP to manage time by working to be organised and efficient, backing off when GPs appeared busy, and prompting them to move on to the next patient (S3, S6, S7).

> To minimise that [time taken] the student could suddenly say "that's enough", if that's a bit rude then something like "I think there is another patient we could see", and the student could encourage the doctor to see two patients instead of one before coming in [to join the student].(S3)

6.5.1 Financial implications

As described in the literature review, clinician time is irreversibly intertwined with clinician productivity, specifically with the concepts of number of patients seen, with doctors’ billings. Medicare billings for Australian vocationally registered doctors are

based on the complexity of the problem rather than on the time allocated to an appointment (GPa11). Most GPs described that there was little change in their bills when precepting (GPa17, GPp33). Most did not consciously discount as they perceived that the patient received the same service or "two for the price of one" (GPp2, GPp5, GPp8, GPp9, GPa10, GPa11, GPp31).

A few doctors described discounting for precepting consultations when it was not their usual practice (GPp19, GPp24, GPp27). This was reported to be more likely when the patient booked with the student, and seemed to be related to GPs having a less secure doctor-patient relationship when they did not know the patients well, or if the time taken to review the patients was brief and yet the complexity of the problem warranted a standard consultation bill (GPp19, GPp24, GPp31).

Some doctors however described fewer long consultations occurring due to their perception of time pressure (GPp2). On reflection, some GPs described no increase in session length but working harder for the same billings (GPp3).

Many doctors described reducing their bookings by one to three patients per session (GPp5, GPp13, GPp14, GPp19, GPp26, GPp28) and some doctors described this impacted financially (GPp13, GPp14). They often still ran late (GPa11, GPp26, Gp32). Interview participants described feeling pressured by long patient waiting times (GPp2, PM6, GPa11, GPa12, PM 23) and by reduced available appointments (PM6, GPp19, GPp24).

Motivation to precept was not strongly related to remuneration; however, financial

recognition was perceived to affirm that precepting was valued (GPa1, GPa10, GPp13, GPp14). When asked about personal remuneration, most GPs also considered non-financial rewards like academic status and professional development points; however, these were not valued highly (GPa11, GPa17, GPp31, GPp33). There was a feeling that relative personal remuneration improved during the year as students increase their roles in the consulting session (GPp13).

Practice partners were remunerated through negotiated proportional redistribution of Practice Incentive Payments (PM4, GPp9). These are payments made directly to the practice for specific health target outcomes or activities additional to routine consulting, like precepting. Assistants who were paid a sessional rate reported that their income was fixed so the decision to precept or not was made by weighing interest versus effort, as reduced patient numbers was of no financial consequence to them (PM4, GPp28). Assistants who were paid a percentage of their billings usually did not gain financially as few practices redistributed Practice Incentive Payments to assistants (PM4, PM6, GPp13).

Students were aware of the personal financial implications of time when precepting (S2). They perceive that partners were somewhat buffered by partnership distributions (S5). However they believed that precepting was not worth the money and felt that this meant that they were not placed with disinterested GPs (S7).

6.6 Summary

The results in this chapter demonstrate that GPs in this study consistently experienced time pressure in their roles, due to the constant intrusion of competing priorities. Time pressure increased when they precepted medical students. GPs developed patterns of behaviour in response to time pressure including containing the time spent on any single clinical activity by consciously allocating limited time, rushing, avoiding interruptions and sometimes reducing the active role of students. Some duties were deferred to another time and, importantly, when GPs felt confident in student skills they delegated tasks to students. Frequent decision making by GPs, as a response to their drive to remain on time, was demonstrated to be a significant contributing factor affecting the changes found in consulting activities outlined in Chapter Five. Students recognized GPs' sense of time pressure and responded to it, frequently working to support preceptors to contain time.

The drive to reduce time pressure resulted in GPs and practice systems constantly adapting to streamline patient flow and contain consultation times. The time pressure caused by precepting increased GPs efforts to remain on time for appointments and motivated some doctors and staff to reduce appointment numbers. Tension resulted as a consequence of the opposing motivation to be accessible to patients through offering further appointments. Financial impact was found to be of little concern to GPs in this study in part due to Practice Incentive Payments. The tension caused by the drive to provide adequate appointment availability to the GP's patients was found to be more powerful.

This chapter has thus demonstrated the cost of precepting in terms of GPs'

perception of increased time pressure and the patterns of behaviour which ensued to manage this pressure. Having shed light on how GPs respond to the considerable time pressure associated with precepting medical students, it is interesting to reflect on why GPs would commit to precept a student for a full academic year as is the case in the Parallel Rural Community Curriculum. Chapter Seven considers the GPs' perceptions of precepting medical students, with a view to defining the meaning of precepting to this group.

7 THE MEANING OF PRECEPTING

7.1 Introduction

In this chapter, the meaning of precepting to GPs is considered, in order to understand why GPs were motivated to subject themselves to the increased time pressure they felt when precepting medical students. Firstly, data regarding the GPs broad perceptions of the value of precepting is presented. Secondly, data regarding the GPs' experience of the triangular relationship between doctor, patient and student is explored. This is achieved by considering the central role of patient care, and then considering the dynamics described in each of the three relationships within precepting consultations from the perspective of the GP preceptor. Finally, the evolution over time of relationships within precepting consultations time are described.

7.2 Professional Enrichment

In this study preceptors identified many ways that precepting added value to their roles as GPs (Table 7.1). They indicated that precepting provided diversity in their work (GPp2, GPp5, PM5, PM7, GPp9, GPa11, GPp25, GPp26, GPp31, GPp32, GPp33, S3, S5). It offered variety from the routine of solo consulting. Experienced GPs described consulting as "not enough", and GPs could become jaded without a change in their role (GPp2, PM7, GPp9, GPa11, GPp31, GPp32). Precepting provided variety as it was perceived to be intellectually interesting (GPa10, GPa12, GPp13, GPp25).

Table 7.1 Professional enrichment

GPs descriptions of professional enrichment resulting from precepting	Participants
Provided variety from routine consulting	GPp2,GPp5, PM5, PM7, GPp9, GPa11, GPp25, GPp26, GPp31, GPp32, GPp33, S3, S5
Intellectual stimulation	GPa10, GPa12, GPp13, GPp25
Refected on their clinical approach	PM4, GPp5, GPa12, GPp15, PM16, GPa17, GPn18, GPp19, GPp21, GPp25, GPn30
Facilitated personal learning	PM4, GPp3, GPp5, GPp9, GPa10, GPa12, GP14, GPp15, GPa17, GPn18, GPp19, GPn20, GPp21, GPp24, GPp31
Self perception as a master/teacher	GPa1, GPp8, GPp10, GPa12, GPp13, GPp15, GPp31
Community of practice	GPa12, PM16, GPa17, GPp25, GPp27, GPn30, GPp32
Kudos / recognition	GPa1, GPp2, GPp3, GPp5, PM7, GPp8, GPp9, GPa10, PM16, GPp27, GPn30, GPp33, S1, S7
Giving back	GPa1, PM4, PM7, GPp8, GPp13, GPp14, PM16, GPp21, GPp22, GPp26, GPn30, GPp31, GPp32, S2, S5
Recruitment / succession	GPa1, GPp2, PM4, GPp5, PM6, GPp8, GPa11, GPp13, PM 16, GPa17, GPn18, PM23, GPp29, GPn30
Source: interview data	

GPs claimed that precepting medical students made them reflect on their clinical approach, rather than acting instinctively (GPp5, GPa12, GPp15, PM16, GPa17, GPn18, GPp19, GPp21, GPp25, GPn30). They were mindful of their thought processes and explicitly vocalised their clinical reasoning to students (GPa12, GPp19, GPp26, GPp32). They worked to be consistent with the clinical decisions (GPp25).

GPs thought precepting facilitated personal learning. They could update their knowledge and revisit the theoretical basis for clinical decisions with students (S3, S5, GPa10, GPa12, GPp14, GPa17, GPn18, GPp21, GPp24). They were motivated to keep up to date (GPp3, GPp9, GPa10, GPp14, GPp19, GPn20, GPp21, GPp24,

GPp31). They reviewed knowledge in order to teach (S1, S5, GPp3). Questioning and feedback from students was sometimes uncomfortable, but encouraged further self-reflection (GPp5, PM7, GPn18, GPp24).

GP preceptors described precepting as affecting their perception of their own professional roles (GPa1, GPp8, GPa12, GPp13, GPp15, GPp31). Some doubt was expressed initially by GPs as to whether they had enough subject mastery and teaching expertise to become effective preceptors (GPa1, GPp8, GPa12, GPp15, GPp31). Confidence developed over time, until in some cases precepting came to be seen as a primary component of the GPs' roles (GPa1, GPp31).

> I see my role as a teacher and educator of patients and to the upcoming generation of doctors (GPa1).

GPs reported increased collegiate interactions with their clinician peers between practices within the region (GPa12, PM16, GPp27, GPn30, GPp32). There was a sense of this community of practice being intergenerational and including registrars and students as less advanced members of this collective (GPa17, GPp25, GPn30). GPs recognized that as novices, they had valued the support of expert clinicians highly (GPa1, GPa10, GPa12,GPp19, GPp21, GPp31). This motivated GPs to “give back” to the profession by providing support to the next generation of students (GPa1, PM4, PM7, GPa10, GPp14, PM16, GPp21, GPp22, GPp26, GPp30, GPp31, GPp32, S2, S5). This was seen to complete the cycle of professional renewal (PM4, GPp8, GPp13).

GP preceptors also identified with teaching peers, and described that through formal structures of the Rural Clinical School, they gained opportunities to share academic

endeavour with university colleagues who respected their contribution (GPp5, PM7, GPp24, GPp27, GPp32). GPs also valued the kudos they received from their involvement in precepting in the PRCC program. This was not related to formal academic status, but related to recognition of the value of the precepting role (GPp9, GPp25, GPp31). Students respected their clinical mastery (GPp2, S1, S7). Patients and community members were perceived to recognise that the medical practice was investing in developing the future medical workforce for the community (GPp5, PM7, GPp8, GPp9, PM16, GPp27, GPn30, GPp33). GPs claimed that this practice profile affirmed, to the community, the high standard of medical care being offered (GPa1, GPp3, GPa10, GPp27).

> I think that you're becoming a more valued part of the system in helping to teach them: more valued by ourselves, by [university name] and by the community (GPp5).

GPs described that they were motivated to take students as they hoped to influence students' career path to become members of their discipline of rural medicine and/or general practice (GPa1, PM4, GPp5, PM6, GPp8, GPa11, GPp13, PM 16, GPn18, PM23, GPp29, GPn30). A few GPs reflected that this recruitment was more about ensuring the quality of rural general practice through the appropriate motivation of students, rather than increasing rural doctor numbers (GPp2, GPn18). Some study participants expressed a desire to recruit to their own practices, either directly or indirectly, through increased status of the practice as it was recognised as a teaching practice (PM6, GPa17, PM23, GPn30).

The examples of professional enrichment described above were identified by GPs as motivators for precepting. Interestingly, however, these were not the factors GP

preceptors focused their attention on when describing their enjoyment of precepting, and the lack of any of these same factors was not recognized as likely triggers for stopping precepting. GPs continually returned to the subjects of patient care and the triangular relationship between themselves, the student and the patient, suggesting that these were more central considerations.

7.3 Patient care

GPs considered quality patient care to be their first priority (S1, GPp5, GPp8, GPp9, GPa11, GPp12, GPp13, GPp15, GPp22). GPs frequently described patient-centred attitudes and behaviours (GPp3, GPp9, GPp13, GPp22, GPp29). They valued their relationships with patients (S6, GPp13, GPn20, GPp22). GPs sought to satisfy patient needs through meeting reasonable patient expectations; provision of their medical care; providing accessible appointments; and minimizing clinic waiting times (GPp9, GPn20, GPp24, GPp31).

Precepting consultations were mainly considered by GP preceptors to be of equal or higher quality for patients (GPp2, GPp5, GPp9, GPa10, GPa11, GPp14, GPp21, GPp25, GPp27, S5). Students had more time to spend with patients (GPp2, S5, GPp9, GPa11). It was perceived this allowed students to explore patients' problems in more depth, discuss lifestyle issues more thoroughly, or complete more thorough hospital admissions during consulting sessions (GPp2, GPp5, GPa10, GPp14, GPp21, GPp25, GPp27, S5).

> My main professional objectives are my day-to-day relationships with my patients: providing a professional service, with an emphasis on professional. Students don't affect this negatively (GPp13).

Patient consent was sought specifically when students were involved in procedures as there was increased risk of patient discomfort associated with multiple attempts, for example inserting a drip (GPp8, GPa11).

Student scrutiny of the GP was perceived to improve quality of patient care (S1, GPa1, GPp3, GPp22). GPs indicated they were more thorough, more motivated to keep up and more reflective. They valued student feedback on the consultations (GPp3, GPp14, GPp22, GPp25, GPp26, GPp28, GPp32, S3).

> I don't think it affects my capacity to provide good patient care. It may even enhance it. It makes you think. You can get through the day without thinking, and we do forget to question ourselves. "Why are you doing this? Why are you doing that? Or are there better ways?" Things I take for granted (GPp26).

Explanations directed to students were thought to increase patients' understanding of their conditions; however, there was a risk that broader conversations would not concentrate on patient concerns (GPa1, GPp15).

GPs recognised that student involvement could interfere with the doctor - patient relationship (GPp2, S5). This meant some areas of patient concern may have remained unexplored during the consultation (GPa1, GPp2, S5, GPp29, GPp31). Unexplored issues could feasibly affect patient care although often issues could be deferred to another appointment (GPp18, GPp33).

7.4 The doctor - patient relationship

Doctors and students recognised the importance of the doctor-patient relationship. Patient trust was seen as an essential component of this relationship which, in many cases, had been built up over years (GPp2, GPa17, GPp26).

Some doctors described the doctor-patient relationship in terms of patients trusting the doctor's commitment to provide them with their medical care. They recognised that patients sometimes did not open up to students but they worked to ensure that patients were still getting the services they required (GPp8, GPa17, GPp22, GPp26). Their primary focus was to patient outcomes rather than to the process of developing patient relationships (GPp2, GPp9).

> My professional role to the patients is providing a [medical] service. Whether that's either directly or through a third party, I think they are still getting that same service (GPp9).

It was reported that PRCC doctors were responsive to patients when they entered the consultations (GPn30). Where they did not know the patients well, they were aware of behaving more formally, with what they perceived as a more professional approach (GPp19, GPp25). Some patients continued to interact primarily with the students, particularly in clinics where patients were booked with students (GPp9). Other patients transferred their attention to the GPs. Some GPs felt confident to defer to the students to increase the student roles in the precepting consultations. These doctors described pleasure in watching the student-patient therapeutic relationships evolve over time (GPp2, GPp8). They seemed comfortable with patients transferring their emotional "allegiance" to the students.

At the other end of the spectrum, some doctors, who identified as being less comfortable precepting students, seemed to conceptualise the doctor-patient relationship in terms of trust and intimacy (GPn18, GPn20, GPp26, GPp29, GPn30). These doctors valued the intimacy highly and attributed their own therapeutic capacity to the patient's willingness to "open up", which in turn was attributed to this fragile and revered personal connection. These doctors recognised the difficulty in patients developing trust and may have been reflecting their patient populations (GPn20, GPp26). However the doctor-patient relationship provided a secondary gain to these doctors which they were careful to protect.

> I suppose I wonder if the patients are truly happy with the students being in the consult, or if they are uncomfortable sharing their dim dark secrets. I am circumspect but sometimes I wonder if the patients are really thinking “I will go along for the ride with you but I am not 100% happy with this”. A lot of my fears are groundless and probably they could be easily challenged (GPn20).

When patients booked appointments to see GPs and instead saw students first, they felt the need to give patients time (GPp13, GPp24, GPp31). They were concerned that reduced time with patients risked patients’ perception of their quality of care and patient satisfaction (GPp13, GPp14, GPa17, GPp18, GPp24). This made them feel awkward about billing the patients GPp24, GPp31, GPp32). GPs prevented students seeing some patients, particularly if they were coming for follow up of sensitive issues, had special needs, or if they were be likely to be difficult with the students (GPa10, GPp11, GPp32).

7.5 The student - patient relationship

Patients usually enjoyed their contact with students (PM7, GPp8, GPa11, PM23). In

GP precepting sessions, patient satisfaction was improved by ensuring patients had self selected to book student appointments and were respected if they chose not to see students (PM4, GPp5, S5, GPp8, GPa17, GPn18, PM23). The self-selected patients then presented to the appointment with the expectation that they would see a student (GPa1, PM4, GPp5, PM7, GPp9, GPa11, GPp14). Consent had been obtained initially at the time the patient booked the appointment and was confirmed by staff on presentation to the clinic (GPa1, PM7, PM16, GPn18). Past positive experience with a student was believed to increased a patient's comfort with a student. Practice staff recognised that some patients grew attached to a particular student and sought continuity with him/her (PM4, PM6, PM7, GPp8).

GPs described the desirable characteristics in students as including attributes which made them acceptable to patients (GPp14, GPp19, GPp22) (Table 7.2). This meant being personable (GPp2, GPp3, GPp5,GPa12, GPa17, GPp28, GPp33) and sensitive to patients (GPp4, GPp8, GPp14, GPp26, GPp32). Study participants reported valuing dressing appropriately (GPp14, PM23), respecting patients (GPa12, GPp14), being interested in patients (GPa1, GPp5, GPp8, GPa11, GPp24), reliable (GPa1, GPp2, GPp25), on time (GPa12, GPa17, PM23, GPp25) understanding the importance of clinical commitments (GPa17), knowing their own clinical limits (GPp24), and being systematic (GPa17) (Table 7.2).

Table 7.2 Desirable characteristics in students

GPs descriptions of desirable student characteristics	Participants
Personable	GPp2, GPp3, GPp5,GPa12, GPa17, GPp28, GPp33
Sensitive to patients	GPp4, GPp8, GPp14, GPp26, GPp32
Respecting patients	GPa12, GPp14
Being interested in patients	GPa1, GPp5, GPp8, GPa11, GPp24
Reliable, on time	GPa1, GPp2, GPa12, GPa17, PM23, GPp25
Dressing appropriately	GPp14, PM23
Source: interview data	

GPs were acutely aware that the students acted as their agents in the precepting consultations and that this placed significant responsibility on the students (GPp21, GPp24). Students possessing the qualities described above were thought to be more likely to be perceived by patients as pleasant (GPp3, GPp5, GPp28, GPp33). Some GPs expressed concern that students could undermine or destroy the doctor-patient relationship if their behaviour was not acceptable to patients (GPp8, GPa11, GPp30). When accepted by a patient, the student was seen as an extension of the doctor, and rapport was initially a reflection of the doctor-patient relationship. Students could support their position, save face when unsure, and increase patients' confidence in their safety by deferring to the GPs' expertise (S3).

Students valued the feedback received from patients regarding their performance in clinical roles (S3, S5). Increased clinical experience increased students' confidence in the roles. This new found confidence and the additional time the student could spend with the patient, resulted in increased patient rapport (GPp21). Students then sometimes uncovered new clinical information (GPp8, GPp9, GPp25).

Some doctors described supporting the student-patient therapeutic relationship to develop over time (GPp2, GPp8). Students began to know the patients through the continuity of their therapeutic relationship, and described interpreting for and advocating on behalf of patients in precepting consultations (S1, S5). With continuity over time, the student contributed to a shift in the relationship balance in the triangular interaction between doctor, patient and student - from the predominant doctor-patient relationship to the student-patient relationship.

> Knowing that you are having an input into students who are soon going to be practising doctors. I suppose I particularly find it rewarding that the students get more exposure particularly in a country practice to seeing the same person over again: being able to follow their progress through the year through general practice. It's the breadth of medicine the students are exposed to in rural practice. And, also learning to view medicine from the patient's point of view. Once they start work in the hospital, perhaps they might have more empathy with the people, understand that they are actually people not patients (GPp29).

7.6 The doctor-student relationship

As the students engaged in the clinical settings they began to develop both personal and professional relationships with their GP preceptors. Clear themes emerged from the data (Table 7.3).

Table 7.3 Themes relating to the doctor-student relationship

Theme	References
Student scrutiny	GPp15, GPn18, GPn20, GPp22, GPp25, GPp29, GPn30, GPp33
Student characteristics: personable	GPp3, GPp5, GPp6, GPp9, PM16, GPp19, GPp26, GPp32, GPp33
Student characteristics: clinically safe	GPp3, GPp8, GPa11, GPa12, GPp15, GPp25, GPn30, GPp32, GPp33
Student characteristics: enthusiasm	GPp5, GPp8, GPa12, GPp13, GPp14, GPp17, GPp22, GPp25
Shared enthusiasm	GPa11, GPa12, GPp13, GPa17, GPn20, S3
Social inclusion	PM4, PM7, GPp8, GPa12, GPp32, GPp33
Clinical mastery	GPa1, GPp2, GPa10, GPa11, GPp22, GPp24, GPp32
Student learning	GPa1, GPp2, GPp8, GPa10, GPp22, GPp31
Student development	GPp2, GPp3, GPp5, GPp13, GPp14, GPa17, GPn18, GPp25, GPp28, GPp31
Progressive authentic clinical participation	GPp3, GPp8, GPp14, GPp24, GPp25, GPp33
Companionship	GPp2, GPp5, GPp8, GPp15, GPp19, GPp22, GPp31, GPp32, GPp33, S1, S5
Friendship	GPp2, GPp8, GPp33
Mentorship	GPp2, GPp8, GPa12, GPp13, GPn18, GPp21, GPp25, GPp29, GPp31
Source: interview data	

During axial coding it became clear that themes regarding to the student-doctor relationship were related to one another. The definitions of the cluster categories were defined during meta-coding, and links between these themes are described below.

7.5.1 Scrutiny by students

When students initially engaged in consulting activities GPs described feeling scrutinized (GPp15, GPn18, GPn20, GPp22, GPp25, GPp29, GPn30, GPp33). Students confirmed this in their description of GPs (S1, S6, S7, S9). GPs were aware

that they were exhibiting their knowledge and expertise (GPp8, GPp15, GPn18, GPn20, GPp29). Some GPs, therefore, described student scrutiny as intimidating, particularly as the students were perceived as intelligent (GPp24 GPp32). Their feelings ranged from some personal discomfort because of being 'centre stage', to being 'on edge' (GPn18, GPn20, GPp29, GPn30). Preceptors thought more about what they were doing in order to display their content knowledge and systematic approach, as they understood the importance of students learning by example (GPa12, GPp19, GPp22, GPp25, GPp29, GPn30, S3). They were aware that the students could pass judgment on their actions and were more conscious of their level of clinical mastery (GPp8, GPp29). A few expressed some concern about not being able to meet the naive expectations of students, particularly around definitive diagnosis and fixing the patients' problems, while others were comfortable about student judgments (GPp22, GPp24, GPp33).

> I don't think precepting a student changes the substance of the consultation in a major way but certainly it has the effect of keeping me honest in explaining treatment options to patients and in all those soft situations where you try to decide for example whether or not to prescribe an antibiotic. When the clinical evidence or clinical compulsion for it [an antibiotic] is not all that overwhelming, having a student present has the effect of keeping me more intellectually honest. I know that any decision needs to make sense to the student, and they will have seen me make similar or different decisions in similar situations with previous patients. So it does put some pressure on me to at least maintain some element of consistency in clinical decision making. And that's not a bad thing. It also becomes quite apparent that you are setting what might be a model for future clinical behaviour, so I think that increases the pressure to behave appropriately (GPp25).

7.5.2 Sizing up the student

At the initial meetings between doctor and student, GPs also scrutinized students, seeking evidence of a few key personal characteristics in order to determine if the students were likely to work in a safe and professional manner in the clinical settings.

First, GP preceptors worked to decide if they perceived the students to be personable (GPp3, GPp5, GPp6, GPp9, PM16, GPp19, GPp26, GPp32, GPp33). Personable students who had enthusiasm for medicine and valued clinical involvement were likely to share their common interests with the GP preceptors (GPp5, GPp8, GPa12, GPp13, GPp14, GPp17, GPp22, GPp24, GPp25). Sharing enthusiasm is discussed further in the section 7.5.3.

Second, GPs expressed concern that students could undermine or destroy the doctor-patient relationship if their behaviour was not acceptable to patients (GPp8, GPa11, GPn30). They felt they needed to manage the small but important risk that a patient may object to a student's personality (GPn30). GPs described uncertainty with delegating patient care activities in the consultation to students, until they trusted them (GPp8, GPa11, GPp31). This trust took time to develop, and involved ensuring a personable approach to patients compatible with and respectful of their own consultation styles (GPa12).

Third, doctors have fundamental responsibility for patient safety (S9). In precepting consultations GPs felt responsible for protecting disempowered patients from students (GPp3, GPp15, GPn18). They needed to ensure that the student would not take undue risks with the patient (GPa1, GPa17). GPs indicated that this involved assessment of knowledge and clinical competence, particularly focused history and examination skills, and ensuring accuracy of diagnosis (GPa12, GPp32). It was also important to teach students the importance of communicating openly without alarming patients with dramatic differential diagnoses (GPp2).

> Knowledge wise: I feel that his knowledge was adequate. I would have said that he was good to adequate but I wouldn't have said he was excellent. He was certainly able to go and look things up and check out for himself, which was appropriate. In comparison with our last student we had, who was quite a bit older and who had been in the air force for some time, he was not used to making decisions and taking control, coordinating, and having things organised within a time frame……So no problem with personality, no problem with patient relations, knowledge base and medical techniques is what I would call fair to good (GPa17).

Forming these judgments, and then giving students more active roles in consultations, caused GPs to feel anxious (GPp2, GPp15, GPn18, GPn20). GPs felt unhappy to precept students they considered unprofessional, inappropriate or incompetent, as they would risk patients being unsafe or upset (GPa1, GPp3, GPp14, GPp15, GPp25, GPn30, GPp33).

When a GP preceptors did not know a student, did not trust a student's skills, or considered a student to be less advanced, he/she was more likely to assign a passive-observer role to the student (GPa11, GPa17, GPp28, S1). Although they focused primarily on patients to the exclusion of students, they recognised that the student presence changed their rapport with patients (GPn30). With this passive consultation style, students felt they were not given an opportunity to contribute to the consultation and felt devalued (S1, S3). They understood that the doctor was seeking to remain in control of the consultations; however, they were more likely to be sent out of the consultation when only having passive observation roles (GPa17, GPp22, GPp29, S1, S3). GPs recognised that the student-observer role was not a very effective way of learning for students as they did not have to commit to a diagnosis (GPp28). Used occasionally, some students valued the opportunity to observe expert practice and to reflect on their own experience consulting (S2).

> With a less advanced student it is fairly easy because if they are following

> you, that is straight forward. You charge around and do all your things and you let them learn by osmosis. You have a talk at the end of the day. They are watching you work, rather than working with you, which is a different context (GPa17).

7.5.3 Sharing enthusiasm

Enthusiasm was created by having an interest in common, or by creating that interest in another (GPa11, GPp13, GPn20, S3). Common interest in clinical medicine occurred very early in the contact with students usually in the first consulting sessions and created an immediate positive emotional response for doctors (GPp13, GPa17). Sharing enthusiasm in this common interest was often the most significant personal relationship experience described by doctors involved in short student attachments (GPa11, GPa12, GPa17). This shared enthusiasm was linked to a sense of hope that this interchange would fuel student interest which would facilitate learning, and continue to affect the students' future paths in medicine (GPa11, GPa17).

> I'm a rural doctor. I want to cure the rural doctor workforce. I just think I love rural practice life and I want a lot more people to find out about it. I have skills and knowledge and I like teaching, so it's a bit of everything. It's not about succession planning, it's much more about: the more people out there training in rural the more likely they will come back. ….. It's not really the business side of it. It's more the altruism and the joy of letting people know that you are having a good time (GPa11).

7.5.4 Social inclusion

GPs and practice staff described an early pastoral care responsibility to include students socially (PM4, PM7, GPp8). This was initially superficial where the students were invited to practice social functions; however, if students were seen as personable, social inclusion often extended to being invited for a meal. Here GPs

were sharing their non-professional lives and their family lives, which was perceived as a greater level of personal investment (GPp32, GPp33). The GP was motivated by an attempt to give the student a brief glimpse into the whole picture of life as a rural practitioner (GPa12).

> I wanted to involve him in some of my professional activities other than direct patient contact. I developed a rapport with [student name] when he was here last year so I have a bit of a connection there. I was interested in taking him to a few of the activities that I have been a part of including being part of a men's group which was set up in the town. He came along to one of these meetings. He also came along to a school meeting, as well, about a school program. We are trying to support the school developing greater links with a youth clinic we've got set up here as well. That part of my professional life is about being part of the community and promoting general health and wellbeing in the community through, not just patient care, but through a more public health approach to my work (GPa12).

7.5.5 GP Clinical Mastery

Clinical mastery, defined as the self perception of reaching a self-determined level of competency and ethical standard, was considered an important precursor to feeling confident to precept (GPa1, GPp2, GPa10, GPa11, GPp22, GPp24, GPp32, S1, S7). GPs valued affirmation of clinical mastery through external acknowledgement of expertise (GPp2, GPa10). Students tolerated GPs admitting not knowing but did not tolerate doubt regarding patient safety (S1, S2).

GPs mostly enjoyed imparting knowledge (GPa1, GPa11), and gained confidence in their self perception of clinical mastery when they received positive feedback and respect from students (GPp24, GPp33). This motivated GPs to seek opportunities to teach students (GPp22, GPp33).

> It is good for my ego that after twenty years of practice there is someone there that you can teach something to and pass on some of your skills. And that is appreciated. It does make you feel good (GPa10).

7.5.6 Student learning

When students were perceived to be safe and to respect the GPs' clinical mastery they were trusted, provided with opportunities to participate in the clinical settings and specifically to take authentic roles in the precepting consultations (GPp2, GPp8, GPa10, GPp22, GPp31). These active roles allowed students to develop and demonstrate their learning, which in turn increased the GPs' enthusiasm.

> Seeing someone have an understanding of something for the first time or putting new skills into use. Sometimes they come back and tell you they understand it now. That's rewarding (GPa1).

GPs described having two foci during precepting consultations: firstly the patient problem and secondly evaluating the student's learning (GPp3, GPa11, GPp13). In this precepting model doctors felt under pressure as they worked to meet the competing needs of two parties (GPp3, GPa11). Students sometimes felt their clinical skills and judgment were not trusted, but felt satisfied that GPs responded to their questions (S2, S5). Sometimes however they felt explanations were too complex for patients when directed at meeting their learning needs (S3). GPs were aware of being more instructional in their consulting style with information tending to flow only one way from doctor to student (GPp8, GPa12). The doctor seemed to drive the consultation outcomes without recognition that the student or patient could contribute (GPp8, GPa12, Gpn20).

> I don't discount that I can learn stuff from them too. I tend to think it is a one way street from me to the students but in reality it isn't. If there was time then it would be much more obviously a two way street. One of my weaknesses is I tend to make things a one way street when I educate patients. I don't always actively seek out where they're at, what they already know, and what they can tell me. I am trying to change that style a bit. If I did, it would probably redress the balance. At the moment I just see teaching as a burden because it is a giving thing. Whereas if I was actually receiving something from them that might help, but I am not very good at receiving (GPn20).

With full year attachments, this teacher-healer model of precepting was often a transitional model of precepting as the doctor got to know the student, or was used intermittently throughout the year to assess student progress (GPp8). Doctors describing this as their primary method of working with students, found it excessively demanding and tended to either revert to student observer models or minimise precepting roles (GPn18, GPn20, GPp22, GPp29, GPn30).

7.5.7 Student development

Over time, GPs from the PRCC had the opportunity to see the accumulation of individual episodes of student learning and described student development (GPp14, GPp33). They described students positively in terms of their ability to support their own learning needs; for example, being self motivated (GPp2, GPp5, GPp13), self learners (GPp3, GPp14, GPa17, GPp28) and receptive and responsive to feedback (GPp13, GPp14, GPn18, GPp25, GPp31). GPs were aware of students pursuing clinical opportunities and building on prior learning (GPp8, GPp14, S6). As they developed clinical skills and confidence, they began to anticipate patient needs, and became more sensitive to the pressures on the GP preceptors (GPp14, GPa17, GPp33, S7). GP preceptors received positive reinforcement for facilitating student development (GPp14).

> Its rewarding that you see them when they come in they have very little clinical experience and they don't have the confidence that they do at the end of the year. The first two months the students are getting used to the clinical environment. The next six months they are really improving. And the last few months they are working more confidently. So there is a reward in seeing them develop (GPp14).

GPs who precepted short term students did not describe student development (GPa11, GPa17).

> During the course for the 6 week attachments, the students don't become much more useful by the end of the six weeks. Six weeks is a pretty short time. They could come a little bit more useful but the changes are not that dramatic but if they were coming for 3 months I think you would notice a major change (GPa11).

7.5.8 Progressive authentic clinical participation

By the end of the year, there was a noticeable change in precepting consultations as student development resulted in students having progressively more authentic clinical participation (GPp3, GPp8, GPp14, GPp24, GPp25, GPp33). Supervision of students was reported to be easier as students' input contributed more legitimately to patient care (GPp14, GPp25, GPp27, GPp33). Students described feeling more useful (S5).

> To start off at the beginning of the year, the students try to take a history and a bit of examination but they didn't really formulate any management plans so that when I come in there sometimes is still a lot to do. I think you look forward to coming to this stage of the year. At the beginning of the year there is a lot of input and you are not sure how they will go, but now you are starting to see results. The students start thinking for themselves and it pays off. The more you put in with them early on, the more it pays off (GPp14).

At this stage some doctors conceptualised their role in terms of facilitating the student and patient to meet each other's needs. The GPs continued to accept responsibility for patient care, but also worked to ensure the students took lead roles in the consultations (GPp2, GPp8). In this symbiotic process both student and patient contribute to meeting the needs of the other party (GPp24, GPp28, S2). Patients have part of their health care provided by students (GPp8, GPp9, GPp25). Students benefit from experiential learning and from patients knowledge of their own illnesses and

from their direct feedback (GPp24, S2, S3, S5).

> When you go in with the patient it is different because you greet the patient but then I like the student to present the case first because then if I ask them questions it's with a purpose. The patient is sitting there willing to tell me the story and treat me as a real doctor, so you have to stop them where normally you would try to encourage them to talk. You are acting as the secondary person in the room not primary. So you are actively looking to make sure the interaction continues between the student and the patient (GPp28).

GP preceptors came to see students as intellectual peers and professional equals (GPp3, GPp14). Students were invited to comment, rather than being provided with didactic teaching, and were provided with sensitive support or critique to ensure their roles were not undermined in the eyes of the patients (GPp3, GPp8, GPp15, GPp17). GPs reported that students enjoyed this more active role (GPp28, GPp33). Students' increased autonomy and supported responsibility allowed them to develop confidence in their clinical roles (GPp21, GPp24, GPp25, GPp33).

Doctors described feeling awkward using this symbiotic precepting consultation style initially, as the consultation felt disjointed (GPa1, GPp14, GPn20, GPp29). The skill of directing the flow of the consultation to allow students and patients to meet their complementary agenda was demanding (GPp2, GPp28). GP preceptors described having a sense of holding themselves back (GPa1, GPp15, GPp17, GPn18). The consultation could progress down a different line than where the GP preceptor would have taken it (GPp15, GPp32). It was described as challenging not to jump in and take over when the GP preceptor was feeling time pressured (GPa1, GPp22, GPp26, GPp32).

> I think consultation time does differ from earlier in their attachment. I think that as they clearly evolved more sophisticated consulting techniques and better medical skills they certainly become much more confident in their

> ability to take an unsupervised history. I have greater confidence in their summaries, which I think have noticeably become more succinct and relevant. I feel much less need to double check the significant features of the presenting history. I'm confident they have gone about things in an appropriate manner. There have been fairly ongoing changes, and their clinical skills have improved over the year (GPp25).

Very rarely were there examples where GP preceptors had supervised students in a manner more traditionally used for the supervision of registrars, where GPs left students to seek help as required (GPp9, GPa17, GPp21). In this doctor-as-advisor precepting model, patient safety was not under the control of the preceptor and students could feel abandoned (GPa17, S2). The drivers to use this model when precepting medical students, were related to a high level of confidence in students perceived to be functioning clinically well above the norm for their peer group, and the fact that time could be saved using this model of precepting (Gpa11, GPp21, GPp33).

> It’s interesting that she [GP preceptor] doesn't want to be bothered with "trivial things" having only just met me. It's assuming a lot to think I can differentiate what's trivial from what's not (S2).

7.5.9 Companionship

Returning to consideration of the personal relationship between doctor and student, the author described above the relatively superficial nature of relationships which develop in short-term attachments, with few doctor-student relationships progressing beyond shared enthusiasm and social inclusion (GPp2, GPp5, GPp8, GPp15, GPp19, GPp22, GPp31, GPp32, GPp33, S1, S5). In the PRCC where students were attached to general practices for a full year, the initial social investment was highly valued by students (S3, S5, S6). GPs and students described the development of companionship

over time (GPp2, GPp8, GPp22, GPp31, GPp32, S1, S5). Friendliness, mutual comfort and camaraderie seemed important (GPp2, GPp5, GPp15, GPp19, GPp22, GPp33, S1). There was a sense of knowing and respecting each other and empathising with each other regarding their professional roles and needs (S1, S5, GPp31, GPp32).

Companionship was reciprocated and GP preceptors felt the consulting sessions were more social (PM4, GPa11, GPp33). A few GPs came to describe students as friends, as well as valuing students as future colleagues (GPp2, GPp8, GPp33). This may have been in part due to the similar age of more mature graduate entry medical students and their GP preceptors. Students gained a sense of belonging to the practices (PM4). This sense of team membership increased their understanding of, and motivation to contribute to, the GP preceptor's agenda (S6, GPp9). This was demonstrated, for example, in the way the students contributed to managing time pressure, as described previously in Section 6.4.4.

Companionship did not seem necessary for authentic clinical participation to occur, but it seemed to facilitate both student learning and a more responsible clinical role, as companionship was based on trust and a shared understanding of each other.

> I know from being a student, a doctor builds up a rapport with the student and they are more confident with that doctor. Remember at medical school and you had to present cases in a ward round or present cases to a consultant you would feel so much more confident and how could you (sic) make a mistake or show that you were unsure about something with some consultants whereas others you prefer to clam up and not make a fool of yourself. You can't build that rapport with someone in that sort of student-teacher situation in a week. It does take a while before the students feel confident they can present a case to you and that you are not going to belittle them, and just feel that you were going to be supportive I suppose (GPp31).

7.5.10 Mentorship

Not all preceptors and students experienced mentorship in association with long clinical attachments. Mentorship occurred when GPs described consciously working to pass on a bit of themselves to the student (GPp2, GPp8, GPa12, GPp13, GPn18, GPp21, GPp25, GPp29, GPp31). GPs described fostering professional values (GPp2, GPp18, GPp21, GPp29). They sought to influence students' broader approaches to medicine (GPp8, GPa12, GPp13). They believed students would gain something beyond the knowledge of diseases and their management. There was a sense of connecting with students and being of value to them (GPa1). Some GPs described feeling an increased responsibility to facilitate student learning (GPp12, GPp31). This could facilitate both increased authentic clinical participation and, more specifically, the student focused learning goal of preparing for their final exams.

> To see people grow and to think that they develop their medical career as a result of being with me and in [town name]. That is exciting (GPp32).

7.6 Summary

GP preceptors continued to recognise the central role of patient care in clinical practice. GPs, describing their primary focus in terms of patient outcomes, felt this was compatible with student precepting if students were deemed personable and safe in the clinical environment. Although many types of professional enrichment were identified by GP preceptors as adding value to precepting, the doctor-student relationship was clearly defined as the most important motivator for precepting in this study.

The doctor-student relationship matured over time in the year long PRCC

attachments. Where short-term student attachments allowed for shared enthusiasm to develop as well as superficial social inclusion opportunities, there was rarely time for the development of companionship. In longer placements, companionship developed, illustrated by a sense of knowing and respecting each other and sharing camaraderie within the workplace. When social circumstances matched, friendships developed. These personal bonds between preceptors and students motivated GPs to contribute to the student learning agenda; for example, through assisting in preparation for exams. Not infrequently, mentorship relationships occurred where GPs described seeking to pass on to students their own values and professional principles.

Students were provided with an active clinical role if mutual scrutiny resulted in student respect for the supervisor's subject mastery along with the GP preceptor's confidence that the student was personable and safe in the clinical context. When learning was demonstrated, GP preceptors felt rewarded. In longer attachments, students could demonstrate development over time. This development, coupled with the students' insight into the pressures experienced in general practice, led to progressively more authentic participation as a clinician over the course of the year.

In the parallel consulting model, students were given agency of the doctor-patient relationship when seeing the patient on their own prior to being joined by the GP. When joined by the GP, the dynamics of precepting consultations changed during the year as students participated more actively in the consultation, driven by their relationship with the patient and their increasing confidence in their clinical skills. The student role lead progressively from frequently passive, to competing with patient care, to more symbiotic with patient care. GP preceptors described this in

terms of students becoming more useful and precepting sessions becoming less effort in the course of the year.

8 DISCUSSION AND CONCLUSIONS

8.1 Introduction

Having presented the findings of this original research in Chapters Four to Seven, this chapter places these results within the context of the current literature, and argues for the implications of these findings in relation to existing understanding of how GPs respond to the time impact of precepting medical students.

A a new understanding of the time impact of precepting, through presenting the complex-adaptive changes that occur to enable no change in objective measures of consulting time is established. Then the manner in which time affects the doctor-student relationship is explored. The doctor-patient-student interactions within precepting consultations are demonstrated to change in response to time pressure and maturation of the doctor-student relationship. Finally, gaps in the evidence requiring further research are highlighted before presenting the final conclusions of this thesis.

8.2 Outline of the study findings

8.2.1 Time impact of precepting

This study showed that consultation time did not increase when rural GPs precepted medical students using the parallel consulting model. This is consistent with previous time-and-motion studies of consultations from the USA where students saw patients before the preceptor joined the consultation.[60,66,75] Effective teaching behaviours[147] clearly did not increase precepting consultation time in this study. This is an

important finding, as previous studies aimed at measuring time efficient precepting models have assumed effective teaching based only on previous student feedback of preceptors included in the study,[75] or have used daily surveys to estimate consulting times.[63] No significant difference in precepting consultation times were found over the course of the academic year, casting doubt on the proposition that prolonged student attachments become more time efficient.[74] This finding demonstrates that the parallel consulting model is time efficient as early as four weeks into a year long rotation with medical students in their first year of clinical training. More research is required to define whether parallel consulting takes more time in the first four weeks of a student attachment.

Non-consulting time during the precepting session was also demonstrated not to increase in this study. This study is unique in defining both the consulting and non-consulting time in GPs' consulting sessions. Together, the consultation time and non-consulting time findings confirm that GPs did not increase time spent consulting in general practice, when they precepted a medical student using the parallel consulting model.

This study clearly demonstrates that precepting medical students using the parallel consulting model does not take time. This conclusion is at odds with conventional wisdom and the results of previous studies.[42,53,55-59,61] Many of these studies used self reporting as the means of estimating time.[55,61,63,64] Doctors in these studies may have over-reported time spent precepting as providing time to students was an expectation of university departments. This explanation was proposed to explain the results of Crandall's 1986 study from theUSA which showed the faculty estimated 28.7% of

their time was spent in patient care in the company of medical students, whereas only 7.8% of the time observed was.[150] In Crandall's study, the proposal that interaction with medical students was over-reported as it was an expectation of faculty was found to be unlikely, as research actitities were not over-reported.

An alternative explanation for the increased length of day when precepting in previous studies[42,55,57,59,61,64] is that doctors' recall of the time commitment was inaccurate. This poses the question of why the experienced or remembered duration of an activity was not simply a reflection of its actual duration. Psychological studies have shown that memory of duration of an activity is dependent on the number of recalled events occurring during the activity,[151] and the extent to which those events constituted a contextual change, particularly when the cognitive processes used were not routine.[152]

Finally, the increased length of day found in time and motion studies[58,59] could be an accurate description, reflecting outmoded student teaching systems that did indeed take extra time.[153]

In order to generalize the data from this study to other populations of general practitioners, GP demographics and type of practice were included in the initial regression analysis and significant confounding factors included in the final statistical analysis model. The GP and patient demographics in this study are similar to South Australian rural practice[31,37] and consultation times have a similar range to Australian norms,[132] indicating these findings are able to be generalised across the Australian general practice context. Differences in health care delivery systems may

limit the transferability of these findings internationally. More research needs to be done to ensure parallel consulting is a time efficient precepting model in other clinical contexts; for example, in other medical specialities and allied health professional disciplines.

When considering the generalisability of the finding that precepting does not increase GP consulting time, it is clear that this conclusion is not transferable to practices where parallel consulting is not possible, as a separate consulting room is not available for student use. This consideration highlights the importance of supporting general practice infrastructure requirements, in order to develop sustainable community-based medical education models.[16]

The majority of participants in this study felt that precepting took longer than solo consulting. This finding was consistent with the literature, which described GP's single most significant stress when supervising medical students was time pressure.[39,44,50-54,87] More importantly, this study found a clear discrepancy between GP perceptions of increased consulting time when precepting, and the objective findings of no change in time. This confirms the inconsistencies described above in literature reviews between self-reported precepting time and third-party measurements.[46,47,150,151] Possible explanations for these seemingly contradictory findings were explored, and it can now show that actual duration and experienced duration are not interchangable measures, but capture different aspects of the impact of precepting. The differences between these findings can be explained by seeing GPs and their practices as complex-adaptive systems resulting in objectively measurable changes in GP activities.

8.2.2 Adaptation to time impact

The study demonstrated that consulting activities changed when GPs were precepting students in response to managing the triangular relationship between doctor, patient and student[34]. During precepting consultations, there was increased time spent history-taking, most likely because of the complexity of having to unpack student interpretations, check accuracy of history features, and resynthesise the student's clinical reasoning. The higher-order skills required for this task have been recognised previously in the literature.

> It takes considerable experience, first as a physician and then as a clinical teacher, before a physician is able to integrate second-hand information about patients in order to make good decisions. To make the task even more complex, teachers are trying to assess not only the patients' problems but also the learners' problems[154] p140.

Some doctors reverted to taking a history directly from the patient with the student relegated to the role of passive observer, demonstrating that they were uncomfortable with the third party history-taking approach. This occurred when they felt the students had not captured the salient points in the history, or they reported finding this more demanding history-taking skill difficult. GPs described giving students a more passive role when they felt especially time pressured. Productivity has previously been shown to be maintained when students are given a more passive role in the consultations[59]; however, this study found that an active student role was associated with the GPs' perception of more work, rather than an objective finding of more time. This is an important finding as a previous South Australian study found 18% of GP preceptors restricted students to observing.[38]

There was less time spent by GPs examining patients in precepting consultations.

GPs tended to accept students' assessments when they reported no abnormalities on physical examination, but checked positive signs reported by students and repeated examinations critical for the exclusion of serious diagnoses. Although patient safety is the immediate responsibility of the GP preceptor, this finding has important implications for universities. Students must be prepared to be confident to report when they are uncertain of physical findings, in order to ensure patient safety in the general practice setting.[154] This finding helps to explain why consultation time lengthened when GPs were unfamiliar with a student's performance or assessed that a student was less competent than their peers.[155]

Examination, management and clerical activities were briefer in precepting consultations, as these responsibilities were delegated or deferred. Reductions in these consulting activities were not conclusively demonstrated in previous studies of consultant activities.[60,74,75] Frank's study, however, demonstrated reduction in some management duties by GPs, including feedback to patients' post physical examination, and less time answering patient questions in precepting consultations.[66]

Containment of the time taken in these consultation activities was reported to require more mental effort due to frequent decision making by GPs. As a response to their drive to remain on time, GPs and practice systems were motivated to reduce patient appointments; however, they were also influenced by an opposing motivation to be accessible to patients through offering further appointments. In the literature to date, patient numbers have only been considered in terms of changes in GPs' revenue.[46,53,55,56,65] Revenue reduction did not concern the GPs in this or other previous studies.[51,62] The tension experienced by rural preceptors to provide

accessible medical services has largely been ignored in the medical education literature to date, although patient access has previously been recognized as a factor contributing to patient satisfaction.[156]

During precepting consultations, GPs spent over a minute per consultation directly teaching students. This has been recognised to be enough time to facilitate student learning using a number of clinical teaching models; for example, 'Teaching on the Run' or the 'One Minute Preceptor' models.[153,157,158] Interestingly, these models focus on how to efficiently and effectively teach students and tend to see patients as subject material, underestimating the value of the student-patient relationship to student learning.[159-161]

This study demonstrated how GPs and their practices adapt to the students' presence in the precepting consultations to preserve time, and also described how PRCC students supported GPs to manage time. These developments are explained by considering general practice to be an open complex-adaptive system.[101]

> A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents.[162] (Page 625).

This theory recognises that phase transition occurs once a system (in this case general practice) reaches a critical level of complexity and diversity. The system adapts to the new situation and becomes self-organising.[163] New practice procedures become "emergent" properties of the practice, and precepting is incorporated into the usual business of the practice. Complex adaptive systems have the capacity to adapt when there is efficent flow of information in the system to provide timely feedback through the relationships between system components (such as the waiting room

filling being fed back to GPs by reception staff), and sufficient level of diversity to allow alternate adaptations to occur.[163]

When comparing how GPs and practices adapted to the time pressure of precepting with the rudimentary conceptual model (Figure 2.3), it is clear that this model was simplistic and failed to recognise that the factors defined in the model are incomplete and moderate the effect of each other. It also failed to recognise the adaptation behaviours adopted by individual GPs and practices are context specific and are affected by individuals conscious intentionality.[163]

Previous studies have described preceptor tension associated with managing relationships with the patient and the student [100,134,154]. In this study, GPs' experience of the triangular relationship between doctor, patient and student was demonstrated to take significant mental effort. Through the interview data, the author recognised the link between this mental effort and the GPs' experience of time pressure. Mental effort may also explain Baldor's finding of increased stress in younger preceptors.[56]

Students in this study were given some agency for the doctor-patient relationship when engaged in parallel consulting, as they saw the patients on their own prior to the GPs joining the consultation. The clinical supervision literature recognised the importance of this concept previously when considering patient satisfaction,[164-166] and GPs' perception of the risks students pose to the doctor-patient relationship.[39,61,71] GPs have previously identified the need for students to be able to conduct interviews effectively and politely.[167] This study however, progressed beyond previous literature to propose that the agency of the doctor-patient

relationship is transferred, when preceptors perceive their role to be patient outcome focused rather than patient relationship focused, and the student is considered to be adequately personable and safe in the clinical context. More work is required to understand how GP preceptors make these judgements and how medical students experience these processes. Further research is required to define how students influence GPs' consulting activities.

8.2.3 Time and the doctor-student relationship

So why did GPs commit the time to precept? This question is particularly interesting in this study when considering GPs were committing to a year-long integrated student attachment. The factors which have been recognised in the medical education literature before were described by GP preceptors in this study as adding value to their clinical role. They included variety from routine consulting,[48] intellectual stimulation,[52,88] reflective practice and personal learning,[62,71] self-perception as a master clinician and preceptor,[39,52,81,88] community of practice membership,[94,95] kudos,[49,91] giving back,[41,62] and recruitment.[41,42,57,84,168] In this study, however, all these factors were demonstrated to be inconsequential in comparison with the doctor-student relationship, as they were not the factors GP preceptors focused their attention on when describing their enjoyment of precepting. The lack of any of these same factors was not recognized as likely triggers for stopping precepting.

The primary significance of the doctor-student relationship in precepting has been suggested in previous studies, which have described positive student responses as the most significant factor in preceptor recruitment and retention.[39,42,51,60,84,87,88] This

observation caused a re-examination of the rudimentary conceptual framework developed by the author early in the research (Figure 2.3). Through hypothesis building, a key outcome of explanatory case studies,[126] this study progressed understanding of why GPs precept, by describing in detail the maturation of the personal and professional components of the doctor-student relationship over time. The maturation occuring in the personal and professional relationships between doctor and student are illustrated in Figure 8.1.

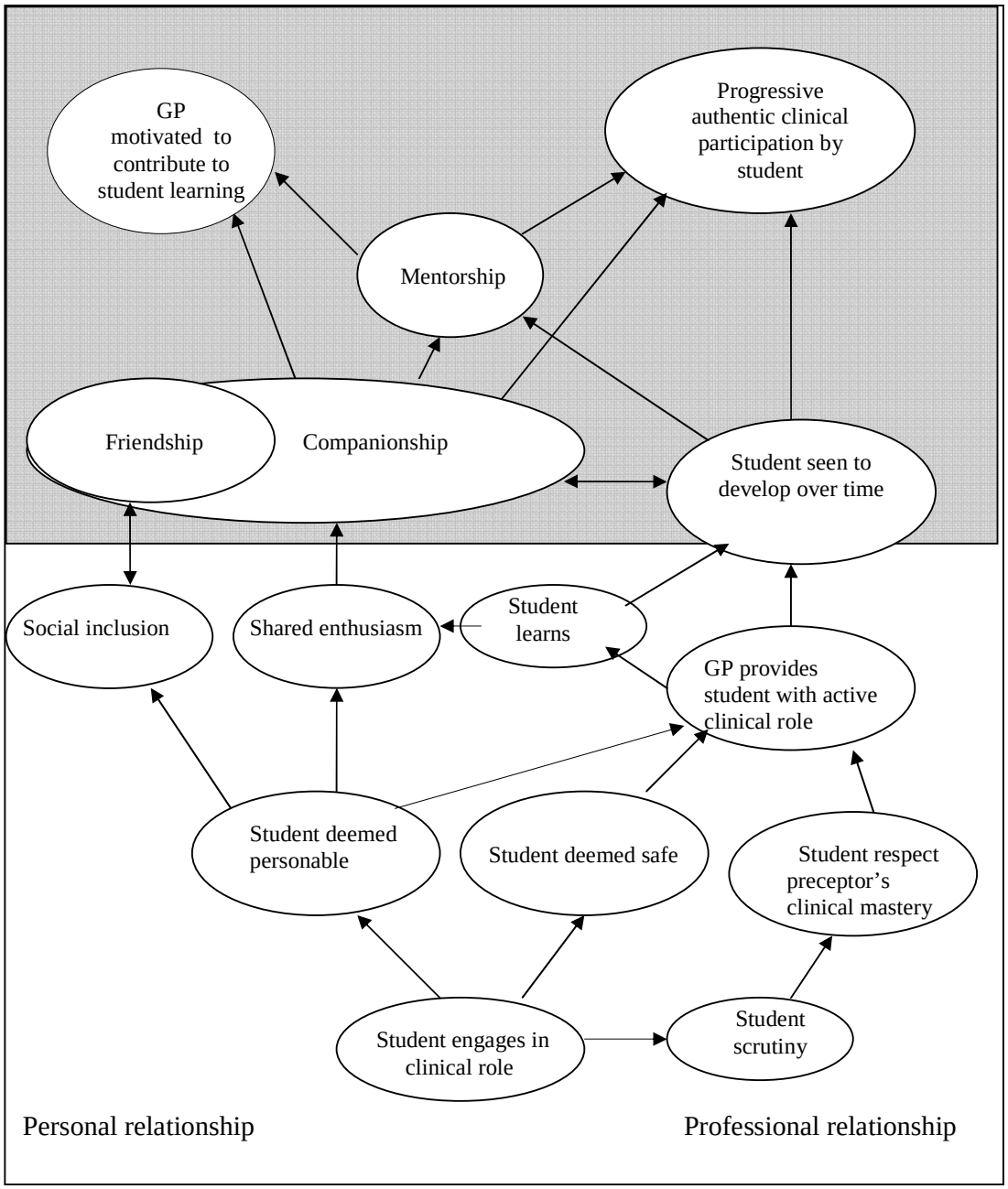

Figure 8.1 Maturation of doctor-student relationship

This study demonstrated that GPs enjoyed sharing enthusiasm for clinical medicine with personable students, and developed superficial social relationships by including students in social and personal activities. The level of social and professional isolation GPs experience when consulting was demonstrated in this study, by the

finding that less than four minutes of non-consulting time was spent socialising with peers, and staff in a half day session. It is not surprising that GPs described enjoying the company of students, when precepting resulted in an average of more than 10 minutes of non-consulting time spent socialising in any half day session. Although GPs may precept due to altruistic motives such as a desire to give back,[41,62] these findings suggest a secondary gain for GP preceptors who experience consulting as a primarily solo endeavour.

Longer student attachments brought further reward for PRCC preceptors as there was time to develop companionship with students, with a strong sense of knowing and respecting each other and sharing camaraderie within the workplace. In year long attachments, personal bonds between preceptors and students motivated GPs to contribute to student learning agenda. Not infrequently, mentorship relationships occurred where GPs described seeking to pass on their own values and professional principles to students.

Professional relationships between doctors and students also matured in the year long PRCC attachments. Students were provided with an active clinical role if mutual scrutiny resulted in student respect for the supervisors' subject mastery, and GP preceptor's confidence that the students were personable and safe in the clinical context. When learning was demonstrated, GP preceptors felt rewarded. This has been recognized previously in the literature.[62,88]

In longer attachments, students could demonstrate development over time. This development, coupled with the students' insight into the pressures experienced in

general practice, lead to progressively more authentic participation by the students as novice clinicians over the course of the year. This finding confirms that longer student rotations are valued by students because the additional time provided continuity of care of patients[169] and allowed them to feel useful as they increased their contribution to patient care.[29,169,170] Effective learning has been demonstrated in apprenticeship models through the process of "legitimate peripheral participation". This concept describes how novices work alongside master practitioners and contribute to the objectives of the group through meaningful duties.[171] In this study students' authentic clinical experiences progressed from simple and discrete tasks to more comprehensive clinical activities during the year. This occurred as GPs came to know and trust the students better and witnessed their consulting skills develop. Precepting sessions therefore were perceived by GP preceptors to take progressively less time over the course of the year as the students became more useful.

Student evolution over the academic year was shown to have a dramatic effect on GPs' perception of the effort required to precept. PRCC students have previously been shown to improve their educational outcomes when compared with peers rotating through eight week hospital-based attachments.[28] They also maintain altruistic patient-centred values while these may be degraded in tertiary hospitals.[172] GPs and students therefore both benefited from the PRCC full year precepting arrangement. This reciprocity between medical student learning and GP patient care responsibilities has been recognised previously by the symbiosis framework for community-based medical education, which describes how medical students in community clerkships are interposed between four relationship axes: clinician-patient, personal-professional, university-health service and government-

community.[43,173b,174] The symbiosis framework hypothesises that students gain entry to and benefit from clinical exposure by contributing meaningfully to (in this case) the clinical (clinician-patient) axis. This thesis builds on Prideaux and Worley's work[34] by considering how symbiosis is achieved along the clinical axis from the perspective of the GP preceptor.

The maturation of the doctor-student relationship over time did more for GP preceptors that simply increasing the efficiency of precepting. As students learned, they began to construct their identities as novice members of the medical profession,[175] and reaffirmed the preceptors' roles as experts in the community of practice of rural generalists. GP preceptors recognized they became more reflective in their practice and increased their own learning. They began to identify themselves as different from early career GPs. This recognition of difference led to change in their perception of self [160]. They recognized themselves as clinical teachers.[176] The individual professional enrichment factors described in Chapter 7 as adding value to the role of GPs, can then be seen as logical steps in the process of perpetuating a rural generalist community of practice.[171] Kudos; from students, members of the community of practice and outsiders; allowed preceptors to take a more central role in the rural generalist community of practice.[171] This drove the motivation to give back as this ensured the continuation of this community of practice through the recruitment of new members.

> Learning is a process that takes place in a participation framework, not in an individual mind. This means, among other things, that it is mediated by the differences of perspective among coparticipants. It is the community, or at least those participating in the learning context, who "learn" under this definition. Learning is, as it were, distributed among coparticipants, not a one-person act. While the apprentice may be the one transformed most dramatically by increased participation in the production process, it is the wider process that is the crucial locus and precondition for this

> transformation. How do the masters of apprentices themselves change through acting as colearners and therefore, how does the skill being mastered change in the process? The larger community of practitioners reproduces itself through the formation of apprentices, yet it would presumably be transformed as well.[171] (pg 15)

The maturation of the doctor-student relationship over time not only explains how students become more useful over the academic year, but sheds light on how GPs are changed through precepting. These interpretive findings identify that the majority of previously recognized motivators for precepting are not simply individual positive factors, which can be weighed against the negative factors in order to entice GPs to precept.[2,33,38,56,88] They represent a group of constantly changing interconnected factors which contribute to defining preceptors as central members of their professional community of practice. This is a critical finding, as it challenges the simplistic organisational development concept that univeristies can recruit and retain GP preceptors through increasing rewards. The finding presents an important alternative view which recognised the emergent, self organisng nature of precepting in the rural general practice setting.

8.2.4 Triangular relationship within the precepting consultation

As the student and doctor developed their roles within the rural generalist community of practice, the dynamics of the triangular relationship between doctor, patient and student was demonstrated to evolve. The student role progressed from frequently passive, to competing with patient care, to symbiotic with patient care. GPs described four distinct models of managing the triangular relationship in the precepting consultation (Figure 8.2).

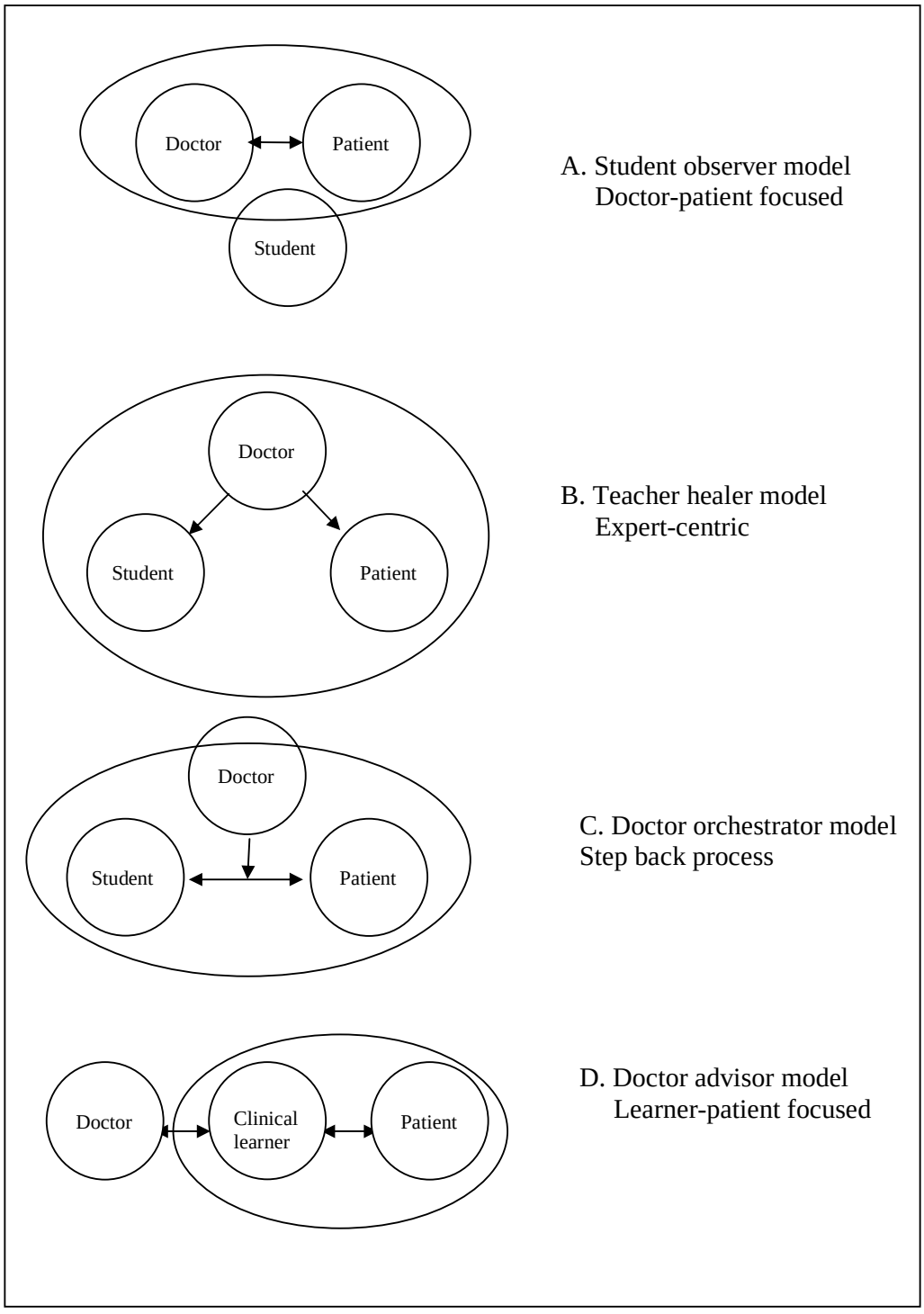

Figure 8.2 Types of triangular relationship recognised in precepting consultations

How and why GPs commit time to precepting

Early in any precepting relationship when the GP did not know the student, the student was often found to have a passive role in consultations. The student-observer model of precepting was more likely to be used (diagram A, Figure 8.2). Doctors tended to frequently behave as if the student was not present. Doctors seemed to be seeking to remain in control of the consultation.

GPs were aware of their commitment to student learning. GPs felt under pressure to meet the competing needs of patients and students and moved to act as the expert and primary provider of both patient care and student learning. They frequently adopted the teacher-healer model of precepting early in the attachment (diagram B). This expert-centric model of consulting occurred when GPs were uncomfortable transferring agency of the doctor-patient relationship to the student, either because they were unsure of or uncomfortable about student skills, or when they were protective of the doctor-patient relationship. GPs were aware of being more instructional in their consulting style, with information tending to flow only one way, from doctor to student. This is similar to the 'traditional transmission approach' to precepting described by Bleakley and Bligh.[160] With full year attachments this model of precepting was often a transitional model of precepting as the doctor developed his/her relationship with the student, or was used intermittently throughout the year to assess student progress. More research is required to understand what triggers GP preceptors to progress effectively from this model of precepting, to a more patient-centred approach where students maximize their learning from patients.[160]

Some experienced and confident GP preceptors had developed a precepting model where they stepped back from having the primary relationship with the patient. The

doctor conceptualised his/her role in terms of facilitating the student and patient to meet each other's needs in this doctor-orchestrator model (diagram C). The GP continued to accept responsibility for patient outcomes but also worked to ensure the student took a lead role in the consultation. GPs described that the doctor-orchestrator model of consulting was made easier when students where well known to the GP, and considered to be highly competent with a systematic clinical approach. Students recognised their agency of the doctor-patient relationship, and responded to the competing needs of patient outcomes and time pressure in partnership with their GP supervisor. In this way the doctor-orchestrator model increased their capacity to contribute to their preceptors' needs. This precepting model is conceptually similar to Bleakley and Bligh's [160] strong patient-centred model. More research needs to be done to define the skills and attitudes required by GP preceptors to successfully use this model of precepting.

In the traditional GP registrar model of supervision (diagram D), assistance is initiated and coordinated by the learner, rather than the GP preceptor. This doctor-advisor consulting model was recognised by most GPs as a different role from precepting students. In this study, GPs rarely reported as using this model as patient safety was not under the control of the preceptor. In contrast to this model, direct student supervision has been shown to have a positive effect on patient safety.[35]

In this study, student progress was described during the course of the year. Students gradually took responsibility for more complete and more complex consultation tasks. GPs described student precepting took less effort as they were able to reduce the frequency in which they acted in a teacher-healer role. Consultation times did not

reduce near the end of the year, suggesting that the doctor-orchestrator model takes less mental effort, but not less time. More research is required to establish whether this progress in consultation style exists in other continuity attachment contexts; and to define the key factors required to ensure this transition occurs.

8.3 Conclusions

This study was prompted by the following question: "How do general practitioners respond to the time impact of precepting medical students?" The significance of this research question was demonstrated in Chapter 1, by defining trends influencing the international move to CBME. This medical education revolution has resulted in recruitment and retention of effective GP preceptors becoming an important issue for medical schools. This case study specifically sought to answer this question within the context of the Parallel Rural Community Curriculum, using the parallel consulting model.

To define "What changes occur to GP consultations as a result of precepting?" an analysis was undertaken of the differences in consultation time and consultation activities for GP preceptors, with and without students. The study then attempted to understand how and why these results occurred using an interpretive multiple-site case study method. The principal case study group consisted of GP preceptors from four rural general practices, which hosted full academic year placements for students in the Parallel Rural Community Curriculum. Qualitative data from this group was triangulated with interviews from current students and practice managers. These findings were compared and contrasted with committed GP preceptors taking short-

term student placements, and with a small group of GPs who actively chose not to precept.

This study showed that consultation times did not increase when rural GPs precept medical students using the parallel consulting model. Despite this objective result, GPs were found to experience precepting as increased time pressure. Consultation activities were demonstrated to change during precepting consultations and this was shown to be the result of complex-adaptive responses by GPs, students and practice systems and staff. GPs described precepting consultations as requiring more mental effort than solo consulting, as multiple decisions were made to balance competing needs of patient care, student involvement and consulting time pressure.

Although some GPs responded to this time pressure by limiting their commitment to precepting, most GPs responded differently. Year long student attachments allowed time for doctor- student relationships to mature, resulting in progressive changes in the dynamics of precepting consultations as students progressed in their authentic clinical participation. Precepting consultations were predominantly student-observer model early in the year, when GPs did not know students well. Teacher-healer style consultations soon became more frequent with some preceptor-student combinations, as GPs juggled the competing demands of patients and students. Later in the year some doctors moved to primarily the doctor-orchestrator model of consulting as they transferred agency of doctor-patient relationships to their students whiile maintaining primary responsibility for patient safety. These GPs stepped back and took on a facilitation role, letting students and patients meet many of each other's needs within the consultation.

The evolution of doctor-student relationships in long-term student placements not only explains how students become more useful over the academic year, but sheds light on how GPs are changed through precepting. This study demonstrated that general practitioners commit time to precepting medical students, not in response to a collection of individual unrelated motivators, but as part of the complex process of recognising themselves as central members of the rural generalist community of practice, and responding to the drivers to sustain and renew this collective by embracing long-term students as novice members of this same community.

9 APPENDICES

Appendix 1: Solely rural studies

Author	Location	Methods	Validity	Results
Ampt (2004)	Australia	Survey and semi-structured interviews	CV: Assumed all supervisors amorphous group. IV: Saturation of themes with 14 interviews. EV: context- Australian rural practice	Themes included: willingness, enjoyment, time pressure, recognition, communication, payment, community services involvement
Barritt et al. (1997)	South Australia	postal survey	CV: 3 point likert scale for measuring agreement to statements IV: No statistical significance calculated, no analysis by demographics. No evaluation of non responders EV: 64% usable response rate,	Defined impacts as positive or negative. Perceived effect on GP family and social life, CME,PD, and level of enjoyment. Neg effect on income
Crandall (1986)	USA	time and motion studies compared with self reporting	CV: how meaningful is percentage of time spent with students? IV: time and motion study compared with self recorded data EV: academic faculty members visiting rural medical services so outcomes may not be transferable to rural GPs	estimated 28.7% of their time spent in patient care with medical students present whereas only 7.6% of time observed Other areas of time estimation consistent Describes time spent as a cost and concludes that must also focus on measurement of benefits
Doyle & Patricoski (1997)	USA	Questionnaire	CV: no details re survey IV: no information available regarding number of subject in the study. Statistical analysis not presented EV: response rate not known	Students added 73.33 minutes to the time spent at their practice per day and patient productivity was reduced by 2.2 patients
Fields et al. (1994)	Oregon USA	Billing and patient numbers	CV: billing and patient numbers one month with students one month without assumes no other sig confounders IV: practices act as own control EV: only 26 practices in study	No sig difference in billing or patients seen with or without student. Some physicians reported extending their days in order to interact with students.
Mahnken (2002)	Victoria, Australia	Semi-standardised interviews	CV: loose force field analysis of specific pre-identified themes. IV: triangulation EV: qualitative research: context specific - ?representative	Time was viewed as commensurate with income. There is no way to replace lost time. Time impact resulted in reduced capacity to have patient consultations. Time linked to energy, income, pt consultations, family and study time. PIP not enough to be an incentive to teach
Oswald (2002)	SA, Australia	unstructured interviews	CV: thematic analysis of interviews around pre-identified themes. IV: triangulation EV: single program, themes can be considered with a view to further analysis	Confidence generated among rural preceptors improves their morale, in turn increasing the support for rural programs.
Walters (2003)	Australia	reflective diary	CV: loose force field analysis of specific pre-identified themes. IV: No triangulation. Themes can be considered with a view to further analysis only EV: Qualitative research: context specific - ?representative	GP preceptor concerns: time, patient care, student learning. Described initial anxiety and early adopters satisfaction following success
Worley P, Kitto P (2001)	Australia	Time-and-motion observations plus log books	CV: reported reduction in consultation length found from GP logs was not confirmed by observation studies IV: activities coded real-time. No audit possible EV: risk to population validity as this sample of 91 consultations may not be representative of precepting.	Student and practitioner logbooks showed mean length of consultation by a GP was 14.4minutes without a student and 9.5minutes with a student.

Appendix 2: Mixed rural and urban studies

Author	Country	Methods	Validity	Results
Adams (1997)	USA	Literature Review	CV: Defined inclusion criterion clearly. Calculated vs estimated dollar value. Philosophy of study time=money IV: results clear but family practice and outpatients dept data aggregated EV: Results not consistent across discipline areas	1. Mostly no change in billing. Within each study a few practices showed increased billings. Presumed related to established teaching practices where preceptors taught frequently 2. Mostly reduced patient numbers (av 2pts/day wide range); 3. 6/7 studies showed increased time spent 4. Total cost calculated - 4 studies no extra cost.
Baldor et al. (2001)	New England USA	5 point Likert scale 12 statements	CV: Likert scale responses to statements assumes inclusive list of impacts IV: Respondents may be more interested in developing and maintaining a relationship with a medical school EV: Largest sample in this area published as of 2001. Sample represents only 26% response rate.	Ranked order of agreement to 12 statements. Comparison of responses between some demographic groups
Bell et al. (1998)	USA	mailed surveys	EV:27 surveys only (60% return rate) CV: survey really aimed at program feedback rather than contributing to the broader knowledge of Preceptorship. IV: no conclusions can be reached except that the program has a reasonably positive group of 27 preceptors who have not accessed their CME entitlements.	40% reported longer days Additional 22% rushed and longer days did not use CME payments
Bowen (2002)	USA	Literature Review	CV: Inclusion criteria defined IV: Studies outside inclusion criteria cited" if supported findings" EV: only included studies conducted in North America	Proposed a theoretical model: 1 optimal learning environment; 2 educational program outcomes; 3 participant satisfaction; 4 costs Model emphasises the inter-relational nature of these components
Chambers (1996)	UK	postal survey	CV: Anxiety and Depression Scale IV: previously validated EV: Response rate 69% but ???/representative. More females than males replied to the survey. Mean age of responders less than non-responders	There was a significant association between high depression scores and working in a non-training practice.
Ferenchick (2002)	USA	Literature review	CV: impact measured in affective, cognitive and tangible domains. Limited descriptions IV: defined some themes, did not explore in terms of GP attributes, attachment properties or teaching styles. Did not synthesize data EV: clear inclusion and exclusion criteria, 22 articles containing data relevant to impact. Only 6 studies dealt exclusively with family practitioners.	Affective Benefits: joy of medicine, relationship with students, satisfaction and pride in teaching/role modelling. Neg: unmotivated learners, paperwork. Cognitive Benefits: learning from teaching - intellectual rigor. Tangible Effects: increase by average of 30 minutes per half day. Recruitment of partners among their learners.

Frank et al. (1997)	Ohio, USA	Clinical Time Use, measured directly by the Davis Observational Code.	CV: No examination of student-preceptor interaction outside the encounter IV: only 83 visits will students so sig underpowered for some assessments EV: Students more likely to see patients with Medicaid than private insurance and more likely to see non-white patients.	When a student was present there was no time difference but the content of the consultation changed: ↑ time discussing visit expectations and other family's member's problem ↓ time history taking, providing assessment and answering questions No less time spent examining the patient
Levy (1997)	USA	questionnaire	CV: clear questions two alternate answers only IV: teaching costs and kinds of assistance desired may have lead to overestimation of drain of precepting EV: 94% response rate.	87% spent more time; 31% saw fewer patients; 25% lost practice income. Neither the reported decrease in number of patients seen nor the reported reduction in practice income was associated with variations in preceptor demographics.
Strasser et al (1999)	Australia	GP Questionnaire & SSI	CV: profile of medical student placements in general practice. Survey of medical schools, Divisions, RWA etc IV: Med school database accuracy issues. Risk of bias associated with developing an argument for GP funding. Comprehensive statistical analysis EV: Data received from all medical schools but only 3 other medical agencies: CATI interview of 36% of 1600 practices. Only 3% of practices had >100 student days per annum	Av Increase 2 hours per day or decrease of 6 - 10 patients per day. Stated av highly sensitive to duration of placements. Consistently positive attitude to reimbursement, regardless of cost reported. Support is very strong when practice management costs are incurred.
Vinson et al. (1994)	USA	questionnaire	CV: physician's perceptions of changes in time and billings. Open ended question asking about benefits IV: T test and analysis of variance EV: single program, 56 physicians surveyed 82% response rate	Mean increased in time spent at work 46 minutes (SD 32.1) but 5 noted no change and 1 noted a decrease No sig relationship between the student's feedback and the physician's perception of amounts of extra time spent
Vinson et al (1996)	USA	Time-and-motion observations	CV: direct observation with and without students IV: activity recorded at random time about every 4 minutes. 1900 observations in each of four categories. Dominant activity recorded Student-centred activities took precedence EV: academic centres and private practice	Private vs academic physicians worked 52 mins vs 0 mins longer with a student present for the day. Substantial shift for patient centred to student centred work.
Vinson et al. (1997)	USA	postcard questionnaire, then with a 4 page questionnaires	CV: GP demographics and attitudes self reported. IV: non-parametric Mann-Whitney U tests and multi variant analysis. Can show correlation but not causative associations EV: Large sample (909 usable responses). 47% response rate to 4 page questionnaire. Effects of response bias assessed and discussed.	30% respondents had taught clinical students. Teacher demography- younger, male, in group practice 30% of family physicians taught medical student in their office; 60% perceived a lengthening of their work day by a median of 30 minutes; 30% perceived a decrease in productivity.

Appendix 3: Urban studies

Author	Country	Methods	Validity	Results
Denton (2003)	Maryland, USA	time and motion study vs self recorded data	CV: Clinic duration recorded by ancillary staff did not differ from duration recorded by physicians IV: how data recorded poorly described EV: only 83 clinical sessions reported, 23 observed outpatient department setting	Added 32mins to clinic time Non-teaching physician activities did not change
Fine and Seabrook (1996)	UK	qualitative study based on in depth interviews	CV: in depth interviews; grounded theory approach to analysis IV: No attempt made to relate opinions to tutor characteristics. EV: Purposive sampling of inner city GPs across demographic spread.	Themes: Motivation for teaching: Intellectual -enjoy working out how to impart knowledge; Emotional - gave value to their work, enjoy the one-to-one relationship. Concerns included lack of time and adverse effect on patient care (part-time & women). Desire for educational, organisational and emotional support.
Foley (1996)	USA	Likert scores for 12 statements	CV: survey of current preceptors. 12 statements Agree-disagree 5 point likert scale IV: statistical analysis not presented EV: 74% of 140 response rate	ranked 12 statements relating to motivation to precept. Most agreement for statements relating to contribute to the development of young professionals and give others some of what they had received from medicine.
Fulkerson and Wang-Cheng (1997)	USA	13-item likert scale questionnaire	CV: survey of current preceptors. 12 statements important-unimportant 4 point likert scale IV: mean scores presented, no stats EV: 62% of 170 response rate	84% found the personal satisfaction of working with students was a motivating factor. The most common response to how their efforts could be best recognised was: clinical appointment. No preceptor directly suggested monetary compensation.
Garg (1991)	USA	appointment logs	CV: standard computerised data collected regarding each patient encounter IV: amount of student involvement calculated by multiplying number of students by length of placement EV: community health centres	no of patients seen compared with national average states from Am MA data suggests productivity reduced by 30 - 40% when teaching
Gray and Fine (1997)	UK	Questionnaire	CV: Rating previously identified problems from strongly agree to strongly disagree IV: 95% confidence intervals quoted EV: 73% useable response rate.	Rewards: mainly learning from their own teaching. Others: belonging to tutors' group; enhancing the doctor-patient relationship; gains in self-esteem and financial reward. Problems: lack of time; lack of space; lack of confidence; worried of adverse effect on patient care. Undergraduate GP teachers more in tune with intrinsic rewards
Grayson et al.(1998)	USA	Questionnaire	CV: Subjective assessment of 14 specific aspects of clinical practice. Reported perceived benefits IV: P values quoted EV: 75% response rate.	82% ↑ enjoyment of practicing medicine 66% ↑ time reviewing clinical medicine basics 62% decrease no of patients seen 49% ↑desire to keep up to date with recent developments in medicine 44% increased patient perception of their status

Heath and Beatty (1998)	New York	Examined patient encounter forms	CV: assumes billing code defines productivity. Average of 3.2 patients seen per hour IV: P values quoted No sig changes found EV: 869 pt encounters but only 4 preceptors	No sig difference between 5 most common billing codes or five most common diagnostic studies ordered.
Howe (2000)	UK	semi-structured interview	CV: range of facilitating and hindering factors IV: Purposive sampling. Clearly described force field analysis. EV: Key tutors interviewed only.	Key facilitating and hindering factors grouped in relation to individual tutor, their practice, the students, and the input of the academic unit. Positive Impacts to GPs: feeling they help students develop; patients benefit by being able to hear explanations; the practice teamwork increases Negative Impacts to GPs: increased time pressure (longer consultation times)
Kearl and Mainous (1993)	USA	Number of patients seen and average charges billed	CV: productivity measured in terms of no of patients seen and billings. Each physician acts as own control IV: 4 months of patient data analysed EV: 15 family practice faculty. Only 1.6 patients seen per hour	No significant differences in billings or patient numbers
Kirz and Larsen (1986)	USA	estimate time used solely for teaching and patients seen per half day	CV: Time estimates subjective, and sig diff from staff estimates suggests overestimate of time when self reported. Cross checks with consumer perceptions and outpatient clinic logs ie estimated changes in productivity matched measured changes. IV: statistical analysis shows difference but not why. EV sampling of all HMOs in service.	Primary care: Mean response for time used solely for teaching with no patient present was 44min (+/- 16.4min) minutes. Nurses estimated the time to be significantly more than the physicians. Objective measurements found a decrease in 1.0 patients per half day.
Kollisch et al. (1997)	USA	questionaire & semi-structured interview	CV: semi-structured telephone interviews IV: Miles Huberman thematic analysis EV: only primary preceptors interviewed	Positive outcomes: a positive teaching experience; intellectual stimulation; patients pride; collegial relationships Negative outcomes: increased time management pressures; slowed down the practice; longer hours; Concerns poor student-preceptor match, evaluating students; problem students; lack of resources for teaching; loss of revenue
McKee et al. (1998)	USA	Daily surveys completed by students and preceptors re teaching time and quality	CV: no details of how a survey filled out. No discussion of accuracy of data IV: relationship between variables extrapolated only EV: Low response rate. Self selected sample of clinicians	Patients seen per hour and minutes worked beyond the end of session did not differ when a student was present. 30 minutes or less per teaching time. General conclusions: minimal time spent observing history and examination skills
Murray et al. (1997)	UK	Semi-structured interviews	CV: tutor's perceptions IV: themes categorised post hoc EV: tutors short-listed and interviewed so most motivated and suitable appointed.	Tutors identified the personal benefits of teaching as development of their own clinical skills and the stimulation of teaching.
Ricer (1997)	USA	preceptor and student actions timed and categorised	CV: results suggests that categorisation was limited IV: no comparison. Results discredited in discussion EV: no discussion regarding how sampling of 26 pairs occurred. ?representative	Calculated time for additional activities 1.23hours Teaching time categorised into 4 options: 1. seeing pts with student 2. Reviewing student findings 3. Teaching 4. Waiting Average total amounts of time the preceptor spent with the student was 3.28 hours per day.

Rutter (2002)	any	Literature Review	CV: relationships between a teaching role and stress. turns defined well IV: inclusion and exclusion critera not defined. Articles included not made explicit EV: articles from all contexts included	4 stressors most predictive of job dissatisfaction and stress were: patient's expectations; interference with family life; constant interruptions and practice administration Some evidence that teaching might mitigate stress
Shesser (1985)	USA	cost of resources and staff time for direct teaching calculated. 286 students	CV: costs calculated for production of videotaped learning resources and estimated hours of time IV: clear description of methods; reported sum of costs, no comparitive data EV: single context, specific output	Students perform an active role in patient care.Cost of instuction and evaluation $86.65 per student plus minimal decrease in patient care productivity
Simon (2003)	USA	interview	CV: in depth open-ended interviews IV: grounded theory approach until no new themes identified EV: purposive sampling of preceptors from different clinical contexts	competing needs of patient (dr-pt relationship), student (educational value) and practice (time and efficiency) the most important factors in selecting patients for teaching.
Slatt (1984)	USA	semi-standardised interview	CV: semi-structured interviews around four defined areas IV: thematic analysis method not explicitly described EV: sampling of supervisors biased towards those more actively involved	Advantages: interaction with students, CME, make medical practice more enjoyable Disadvantages: considerable extra time, isolation from the department, loss of a stipend not viewed as a major problem
Starr (2003)	USA	focus groups systematic content analysis for evidence of themes	CV: five structured focus groups. no description of facilitation process to ensure all voices heard IV: thematic analysis not explicitly described EV: purposive sampling of experienced supervisors across disciplines who attended a 2 day faculty development conference	factors contributing to a strong sense of teacher identity 4 themes suggested in the social sciences literature for teacher identity where confirmed: (1)intrinsic satisfaction; (2)knowledge and skill; (3)external rewards and (4)social supports. Three others were identified: (a) the integrated role of being a physician and teacher; (b) feeling a sense of responsibility to teach medicine and (c) being a representative of their own discipline of primary care.
Ullian et al. (2001) A31	USA	surveys, discussions and AGMs & formal reports	CV: inclusion and exclusion criterion not defined IV: no description of how information from multiple sources was analysis EV: information from 10 medical schools	Desirable impacts: (1) affective, eg. enjoying teaching; (2) cognitive, eg. Own learning; (3) tangible eg. Discount on CME. Undesirable impacts: (1) resource problems; (2) problematic interactions; (3) burdensome/unnecessary administrative tasks. Length of day varied with student from no extra time to 30-45 minutes per half day of precepting. Conclusions discuss recommendations for program management
Usatine et al. (1995)	USA	Attitudinal survey consisting of 53 items. Then SSI	CV: Survey consists of 53 items with only 2 indicators for negative effect . IV: Percentages only, no statistical analysis. Medical students interviewing may have affected disclosure EV:88% response rate. Telephone interviews response rate 63%.	Enjoyed being a preceptor and interacting with student. Patients reported new, mainly useful information to students. Positive feedback from patients. 2/89 believed patient would not return to the clinic as the result of a student. In the telephone interview, 17/19 preceptors said the worst aspect of precepting was the time management.
Usatine et al. (1997)	USA	Time-and-motion observations	CV: time measures by preceptor activity. Other preceptor activities not recorded. IV: Only 33 patient encounters so v small numbers to find statistical significance. EV: "Exemplary" not a normal sample of preceptors	1.1 minutes more spent on patient encounter when student present. Not statistically significant. This time difference did not include preparing for teaching (done before the student saw the teacher), teaching, giving feedback, orientations or clinical conferences at the beginning or end of the clinic. It also did not include the time savings associated with students helping with charting, which all the preceptors identified as being a major time saver.

Appendix 4: GP consent form for videotape study

FLINDERS UNIVERSITY
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OBSERVATION STUDY LETTER OF INTRODUCTION TO GPs
Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

Dear

I am writing to you to introduce the research project of Dr Lucie Walters, a Masters Research candidate at Flinders University. Her project aims to evaluate the impact of medical students on rural General Practitioners who supervise them.

Recruitment of Australia Graduates to Rural areas has been on the National Agenda for sometime. The policies of Commonwealth Dept of Health and Aging are based upon the premise that "meaningful exposure to a rural environment" impacts on medical student career intentions and career progression. There is minimal evidence currently available regarding the impact of this recruitment strategy to the current Australian rural medical workforce. As the Professor of Medical Education of the Flinders University, I am the supervisor of this important and timely project on the impact of clinical medical students on rural general practitioners.

Dr Lucie Walters also teaches Graduate Entry Medical Students at the Flinders University as the coordinator of Greater Green Triangle Parallel Rural Community Curriculum and the Rural Undergraduate Support and Coordination (RUSC) program; and has the approval of the University's Social and Behavioural Ethics Committee. She is undertaking research leading to the production of a research thesis on the impact of medical students on rural general practice.

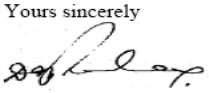
We would be most grateful if you could assist in this research by consenting to be observed during a series of (half-day) clinical sessions. This will involve a video camera being set up in the consulting room. A research assistant, Heidi Rolfe, will be on sight at the clinic for the day to observe your activities and facilitate patient consent for the videotaping of consults. All efforts will be made to notify the clinic in advance of observation days so patients can be informed as they make clinic appointments. A notice will be placed at reception on the day of videotaping, and consent forms will be available to confirm patient informed consent. I would like to arrange that the first of these sessions occur while you supervise a medical student in your usual manner.

Videotapes of consult sessions will be analysed to define the length of time the GP uses to perform specific activities during consultations eg history taking, examination, patient education. Videotapes will be stored in a locked filing cabinet in the secure GGT PRCC office. Only Dr Lucie Walters and her research assistant will have access to this file. *I can assure you that all information provided will be treated with care as to the confidentiality and ethical use of the material. The findings from observational studies will be summarised together. None of the participants' activities will be attributed to them personally in the resulting dissertation or publications.* Participation in the research is, of course, entirely voluntary for all persons, and doctors, patients and students can opt to turn the video camera off for any consultation, should they wish to.

The research project has been approved by the University's Social and Behavioural Research Ethics Committee. **Please fill in the attached fax. Reply Form** for confirmation of your intentions. Any enquiries you may have concerning this project should be directed to me at the address given above, or by telephone on (+61 8) 82045677 or email david.prideaux@flinders.edu.au.

Thank you very much for making your valuable time available to assist in this research. We hope it will uncover some useful information leading to a better understanding of the impact of clinical medical students on rural General Practices. An Executive Summary of the research will be made available for all those participating.

Yours sincerely



Dr David Prideaux
Professor of Medical Education, Flinders University

CONSENT FORM FOR OBSERVATION OF PROFESSIONAL ACTIVITY

The impact of clinical medical students on the work of rural GP preceptors who supervise them.

I ……..hereby *give my consent* to Dr Lucie Walters, or her research assistant; a researcher/research student at the *Flinders School of Medicine* (Flinders University, Adelaide, Australia); and whose signature appears below, to record my work activities as part of a study of professional activities and role in relation to the impact of clinical medical students on the work of rural General Practitioners who supervise them.

I give permission for the use of these data and of other information which I have agreed may be obtained or requested, in the writing up of the study, subject to the following conditions:

My participation in this study is voluntary, and I understand that I may withdraw from the study at any time.

SIGNATURES

Participant……Date……...

Researcher……Date……

2

[2] The project was initially approved by the Flinders University Higher Degrees Committee as a Masters thesis. In 2007, the project as approved by the same committee as candidature for Degree of Doctor of Philosophy.

Appendix 5: Student consent for videotape studies

FLINDERS UNIVERSITY
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STUDENT OBSERVATIONAL STUDY LETTER OF INTRODUCTION

Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

Dear student,

I am writing to you to introduce the research project of Dr Lucie Walters, a Masters Research candidate at Flinders University. Her project aims to evaluate the impact of medical students on rural General Practitioners who supervise them. As the Professor of Medical Education of the Flinders University, I am the Supervisor of this important and timely project on the impact of clinical medical students on rural general practitioners.

Dr Lucie Walters also teaches Graduate Entry Medical Students at the Flinders University as the coordinator of Greater Green Triangle Parallel Rural Community Curriculum and the Rural Undergraduate Support and Coordination (RUSC) program; and has the approval of the University's Social and Behavioural Ethics Committee. She is undertaking research leading to the production of a research thesis on the impact of medical students on rural general practice.

We would be most grateful if you could assist in this research by participating in an observational study of your day to day activities on a day when you are being supervised by a GP. This will involve a video camera being set up in the consulting room where you are situated and where the GP is situated. A research assistant, Heidi Rolfe, will be on sight at the clinic for the day to observe your activities and facilitate patient consent for the videotaping of consults. All efforts will be made to notify the clinic in advance of observation days so patients can be informed as they make clinic appointments. A notice will be placed at reception on the day of videotaping, and consent forms will be available to confirm patient informed consent.

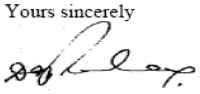
Videotapes of consult sessions will be analysed to define the length of time the GP uses to perform specific activities during consultations eg history taking, examination, patient education. Videotapes will be stored in a locked filing cabinet in the secure GGT PRCC office. Only Dr Lucie Walters and her research assistant will have access to this file. *I can assure you that all information provided will be treated with care as to the confidentiality and ethical use of the material. The findings from observational studies will be summarised together. None of the participants' activities will be attributed to them personally in the resulting dissertation or publications. Participation in the research is, of course, entirely voluntary for all persons, and doctors, patients and students can opt to turn the video camera off for any consultation, should they wish to.*

You will be given an opportunity to review the summary of de-identified data in October 2005. You may gain this information by emailing lucie.walters@flinders.edu.au or by phoning the office on (08) 87258355. Review of the data prior to the completion of the study period will not be permitted as it may influence the results of subsequent observed clinical sessions.

Please fill in the attached Reply Form for confirmation of your intentions. Any enquiries you may have concerning this project should be directed to me at the address given above, or by telephone on(08) 82045677 or email david.prideaux@flinders.edu.au. This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee. The Secretary of this Committee can be contacted on 8201-5466, fax 8201-2035, e-mail lesley.wyndram@flinders.edu.au.

Thank you very much for making your valuable time available to assist in this research. We hope it will uncover some useful information leading to a better understanding of the impact of clinical medical students on rural General Practices.

Yours sincerely



Dr David Prideaux
Professor of Medical Education, Flinders University

MEDICAL STUDENT CONSENT FORM FOR OBSERVATION STUDY

The impact of clinical medical students on the work of rural GP preceptors who supervise them.

I …….hereby *give my consent* to Dr Lucie Walters, or her research assistant; a researcher/research student at the *Flinders School of Medicine* (Flinders University, Adelaide, Australia); and whose signature appears below, to record my work activities as part of a study of professional activities and role in relation to the impact of clinical medical students on the work of rural General Practitioners who supervise them.

I give permission for the use of these data and of other information which I have agreed may be obtained or requested, in the writing up of the study, subject to the following conditions:

My participation in this study is voluntary, and I understand that I may withdraw from the study at any time.

SIGNATURES

Participant……Date……...

Researcher……Date……

3

[3] The project was initially approved by the Flinders University Higher Degrees Committee as a Masters thesis. In 2007, the project as approved by the same committee as candidature for Degree of Doctor of Philosophy.

Appendix 6: Patient consent form for videotape study

FLINDERS UNIVERSITY
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GP OBSERVATIONAL STUDY
LETTER OF INTRODUCTION TO PATIENTS
Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

Dear Sir/Madam,

Your doctor today is a fully qualified General Practitioner who is involved in the teaching of medical students within his/her clinic. He/she has agreed to participate in a study observing a doctor's behaviour with and without a medical student present. This research is important for the ongoing successful training of medical students in rural areas of Australia.

During today's surgery there will be a small video camera in the Doctor's room. It is there to record the Doctor talking to his/her patients. Please note that no physical examination will be recorded.

Following the consultation session, the videotape will be reviewed by Dr Lucie Walters and/or her research assistant Heidi Rolfe. Videotapes of consulting sessions will be analyses to define the length of time your GP spends performing specific activities during consultations eg history taking, examination, patient education. The nature of your health problem will remain confidential.

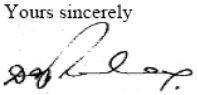
Videotapes will be stored in a locked filing cabinet in the secure GGT PRCC office **for a minimum of five years**. Only Dr Lucie Walters and her research assistant will have access to this file. *I can assure you that all information provided will be treated with care as to the confidentiality and ethical use of the material. The findings from observational studies will be summarised together. None of the participants' activities will be attributed to them personally in the resulting dissertation or publications.*

You will be given an opportunity to review the summary of de-identified data in October 2005. You may gain this information by emailing lucie.walters@flinders.edu.au or by phoning the office on (08) 87258355. Review of the data prior to the completion of the study period will not be permitted as it may influence the results of subsequent observed clinical sessions.

Please fill in the attached Reply Form for confirmation of your intentions. Any enquiries you may have concerning this project should be directed to me at the address given above, or by telephone on(08) 82045677 or email david.prideaux@flinders.edu.au. This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee. The Secretary of this Committee can be contacted on 8201-5466, fax 8201-2035, e-mail lesley.wyndram@flinders.edu.au.

Participation in the research is, of course, entirely voluntary and if you change your mind during the consultation, the recording will be immediately stopped and erased. **Please fill in the attached Reply Form** for confirmation of your intentions. If you choose not to participate in this study you may still consult your doctor as previously arranged.

Yours sincerely



Dr David Prideaux
Professor of Medical Education, Flinders University

PATIENT CONSENT FORM FOR OBSERVATIONAL STUDY
Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

I .....hereby consent to participate in a videotaped consultation as requested in Dr Lucie Walters's Masters Research project

I have read the information provided about the research.

1. Details of procedures have been explained to my satisfaction.
2. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
3. I understand that:
   - I may not directly benefit from taking part in this research.
   - I am free to withdraw from the project at any time
   - While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
   - I may change my mind and ask for the video recorder to be turned off at any time, and the recording will be immediately stopped and erased.
4. I agree/do not agree* to the videotapes of consultations being made available to other researchers who are not members of this research team, but who are judged by the research team to be doing related research, on condition that my identity is not revealed. * *delete as appropriate*

Participant's signature……Date……...

I certify that I have explained the study to the volunteer and consider that he/ she understands what is involved and freely consents to participation.

Researcher's signature……..Date……..

4

[4] The project was initially approved by the Flinders University Higher Degrees Committee as a Masters thesis. In 2007, the project as approved by the same committee as candidature for Degree of Doctor of Philosophy.

Appendix 7: GP post-videotape questionnaire

GP Data for Videotaped session

Session code _____
(*first initial of GP, first initial of practice/ postcode/student type/student week)*

Practice profile
Number of GPs in practice _____
Student attachment type 6 week / PRCC

Session profile
Length of session _____hours
Number of appointment slots for session _____
Average appointment interval _____mins
Is this the way appointments are usually set up for this doctor?
If not, why not?
_____
_____

Student present yes / no

Activities today
This project aims to collect information about your work activities from the beginning of the first consult of your session to end of the session or 5 hours after commencement of the session – which ever is sooner. I wish to collect information to assess how representative this tape is of your working day.

Did your working day commence at the beginning of the videotaped session? yes/no
If not: What did you do prior to the commencement of the videotape session ?
_____
_____
_____

Has your working day now concluded? yes/no
If not: What activities are planned for the remained of your day?
_____
_____
_____

Has videotaping this session affected the way you have conduct this consulting session? yes/no
If so, how?
_____
_____

Session code _____

GP Profile

Age _____years Sex M / F
Country of Birth _____
Qualifications _____
Country where medical degree obtained: Australia / Other _____

Years in rural general practice _____
Years in this practice _____
Hospital inpatient _____
Procedural GP _____
Obstetrics yes/ no Anaesthetics yes/ no Surgery yes/ no

Dr went to school in a rural community yes / no
Dr's spouse when to school in a rural community yes / no / no current spouse
Rural GP exposure as a medical student yes / no Length of attachment_____
Aust Rural GP exposure as a medical student
as above/yes / no Length of attachment_____
No of years taking medical students in the last 5yrs_____0 1 2 3 4 5

If a student was present with you today

How would you rate this student in comparison to his/her peers? (please tick one)

	No student today
	Highly competent
	Competent
	Borderline
	Incompetent
	Unsure

Appendix 8: Student post-videotape questionnaire

Student Data for videotaped session

Session code _____

(*first initial of GP, first initial of practice/ postcode/student type/student week)*

Student Profile

Age _____years Sex M / F

Country of Birth _____

Town / Country where did the majority of high school _____

Is this rural? Yes / no

FFP or domestic student?_____

English is first language? yes / no If not, what language is? _____

Student went to school in a rural community yes / no

Number of weeks student has been in the practice_____

Activities today

This project aims to collect information about your work activities from the beginning of the first consult of your session to end of the session or 5 hours after commencement of the session – which ever is sooner. I wish to collect information to assess how representative this tape is of your supervised day.

Did your interactive teaching with this doctor commence at the beginning of the videotaped session? yes / no

If not: What did you do prior to the commencement of the videotape session ?

_____

_____

Has your consulting day now concluded?

If not: What activities are planned for the remained of your day?_____

_____

_____

Has videotaping this session affected the way you have interacted with your GP supervisor during this consulting session? If so, how?

_____

_____

Preceptor teaching activities

Please rate the frequency of the teaching activities displayed by your supervising GP during today's consultation session.

Activity	Did not occur	Occurred rarely	Occurred frequently	Unsure
Actively involved me as a student in the consultation – including adequate supervision and appropriate independence.				
Developed and fostered a supportive interpersonal relationship with me.				
Emphasised problem solving and general principles.				
Balanced clinical and teaching responsibilities.				
Demonstrated clinical and professional competence				
Used an organised approach including goal setting and summarisation.				
Provided me with feedback regarding my clinical performance.				

Appendix 9: Videotape analysis protocol

Initial data where is 1,2,3?

4. Enter initial data from GP and student survey forms for session onto session database
5. Cut and past onto consult database for each consult
6. Fast forward videotape to confirm complete consult
    a. If not a complete consult record consult start time, age and sex of patient and if student was present and then go to next consult
7. If consult complete: rewind to beginning (defined as the moment the patient and doctor are together in the consulting room); and watch in real time, recording most prevalent activity each 15 seconds.
8. Other data to collect (keep a record for each consult)

Consult code_____ Session code_____

Start time of consult _____

Number of 15 second intervals where doctor laughs for part or all of that 15 second interval	
Number of new medications prescribed	

Patient gender M / F

Finish time of consult _____

9. Pause tape and record data in SPSS
10. Restart tape and record non-consult activities every 30seconds until the next consult starts.
11. Start this process again at No 3. and repeat until end of session
12. At end of session data collection, add data collected from the videotape to data collected at time of recording session to session database

Appendix 10 GP/Practice manager interview consent form

FLINDERS UNIVERSITY
ADELAIDE • AUSTRALIA

Flinders University Rural Clinical School
Greater Green Triangle Parallel Rural Community Curriculum (GGT PRCC)

PO Box 3570
Mount Gambier 5290 South Australia

Telephone: (+61 8) 8725 8355
Fax: (+61 8) 8723 6404
Email: lucie.walters@flinders.edu.au

INTERVIEW LETTER OF INTRODUCTION
Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

Dear

I am writing to you to introduce the research project of Dr Lucie Walters, a Masters Research candidate at Flinders University. Her project aims to evaluate the impact of medical students on rural General Practitioners who supervise them.

Recruitment of Australia Graduates to Rural areas has been on the National Agenda for sometime. The policies of Commonwealth Dept of Health and Aging are based upon the premise that "meaningful exposure to a rural environment" impacts on medical student career intentions and career progression. There is minimal evidence currently available regarding the impact of this recruitment strategy to the current Australian rural medical workforce. As the Professor of Medical Education of the Flinders University, I am the Supervisor of this important and timely project on the impact of clinical medical students on rural general practitioners.

Dr Lucie Walters also teaches Graduate Entry Medical Students at the Flinders University as the coordinator of Greater Green Triangle Parallel Rural Community Curriculum and the Rural Undergraduate Support and Coordination (RUSC) program; and has the approval of the University's Social and Behavioural Ethics Committee. She is undertaking research leading to the production of a research thesis on the impact of medical students on rural general practice.

We would be most grateful if you could assist in this research by allowing Dr Walters to interview. *Confidential* interviews will be used to collect feedback on the impact to you of having medical students in your clinic. In addition to the interview with you, Dr Walters would like to interview a group of your staff and/or colleagues who have a role in the supervision of medical students within your practice.

Interviews will be recorded and transcribed for qualitative data analysis. Once your transcript is reviewed and confirmed by you, any tapes will be destroyed. Transcripts will be stored in a locked filing cabinet in the secure GGT PRCC office. *I can assure you that all information provided will be treated with care as to the ethical use of the material. The findings from a number of interviews will be summarised together. None of the participants' comments will be attributed to them personally either in the individual responses or in the resulting dissertation or publications.* Participation in the research is, of course, entirely voluntary for all persons and everyone will be reminded to decline to answer any questions if you or they wish to do so at any time of the interviews.

The research project has been approved by the University's Social and Behavioural Research Ethics Committee. **Please fill in the attached reply form** for confirmation of your intentions. Any enquiries you may have concerning this project should be directed to me at the address given above, or by telephone on (+61 8) 82045677 or email = david.prideaux@flinders.edu.au.

Thank you very much for making your valuable time available to assist in this research. We hope it will uncover some useful information leading to a better understanding of the impact of clinical medical students on rural General Practices.
Yours sincerely

Dr David Prideaux
Professor of Medical Education, Flinders University

CONSENT FORM FOR INTERVIEW
Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

I .....
hereby consent to participate as requested in Dr Lucie Walters's research project

I have read the information provided about the research.

1. Details of procedures have been explained to my satisfaction.
2. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
3. I understand that:
   - I may not directly benefit from taking part in this research.
   - I am free to withdraw from the project at any time and am free to decline to answer particular questions.
   - While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
   - I may ask that the interview be stopped at any time, and that I may withdraw at any time from the session or the research without disadvantage.
   - The interview notes made during this interview will be made available to me for validation.

4. I agree/do not agree* to the validated interview notes being made available to other researchers who are not members of this research team, but who are judged by the research team to be doing related research, on condition that my identity is not revealed. * *delete as appropriate*

Participant's signature……Date……...

I certify that I have explained the study to the volunteer and consider that he/ she understands what is involved and freely consents to participation.

Researcher's signature……..Date…….

Appendix 11: Student interview consent form

FLINDERS UNIVERSITY
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STUDENT INTERVIEW LETTER OF INTRODUCTION
Dr Lucie Walters's RESEARCH PROJECT:
How do clinical medical students affect the work of rural GP preceptors who supervise them?

Dear student,

I am writing to you to introduce the research project of Dr Lucie Walters, a Masters Research candidate at Flinders University. Her project aims to evaluate the impact of medical students on rural General Practitioners who supervise them. As the Professor of Medical Education of the Flinders University, I am the Supervisor of this important and timely project on the impact of clinical medical students on rural general practitioners. We would be most grateful if you could assist in this research by granting Dr Walters an interview. No more than 20mins on up to 3 occasions over the course of a year will be required. *Confidential* interviews will be used to collect feedback on the impact you feel you have on the clinic to which you are attached. *Participation in the research is, of course, entirely voluntary and you may decline to answer any questions during the interview.* Your choice to be involved in part or all of this interview process will not in any way affect your academic assessment. **Dr Walters will not review your interview until after you have completed the academic year in 2004.**

Notes and an audio tape recording will be made at the time of interview and a copy of the notes will be made available to you for validation. Transcripts will be stored in a locked filing cabinet in the secure GGT PRCC office for a minimum of five years. Only Dr Walters and her research assistant will have access to this file and only after November 2004 for Dr Walters. *I can assure you that all information provided will be treated with care as to the ethical use of the material. The findings from a number of interviews will be summarised together. None of the participants' comments will be attributed to them personally either in the individual responses or in the resulting dissertation or publications.*

Please fill in the attached Reply Form for confirmation of your intentions. Any enquiries you may have concerning this project should be directed to me at the address given above, or by telephone on (08) 82045677; or email david.prideaux@flinders.edu.au, or a supervisor independent of the GEMP medical course; Assoc Prof Colin Sharp email colin.sharp@flinders.edu.au. This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee. The Secretary of this Committee can be contacted on 8201-5466, fax 8201-2035, e-mail Lesley.Wyndram@flinders.edu.au.

Thank you very much for making your valuable time available to assist in this research. We hope it will uncover some useful information leading to a better understanding of the impact of clinical medical students on rural General Practices. An Executive Summary of the research will be made available for all those participating.

Yours sincerely

Dr David Prideaux
Professor of Medical Education, Flinders University

Appendix 12: GP/Practice Manager interview proforma

Dr …… Interview date…… Location…….
Confirmation that:
this interview will be taped and notes made
notes will be fed back to you for your review: feel free to alter or add
consensus document = data
Tape on
1. Tell us a bit about your current student(s)?

2. What is your involvement with the current student(s)?

3. Is this the level of involvement you want with this student(s)? If so why? If not – what involvement would you like and why the difference?

4. The students are now (however far) through their attachment to the clinic
Please consider the last 4 weeks:
Can you describe in as much detail as possible how your working day has differed when you have supervised the medical student(s).

Professional, Personal, Practice

- *time and money*
- *out of consult activities*
- *enjoyment*
- *patient care*
- *consultation style – what activities*
- *concept of professional role*

5. Is this a typical example of how a student would affect your working day at this point in their attachment? Why?

6. What are your main professional objectives; and how does having medical students affect these?

7. Why do you supervise medical students? What motivates you to supervise students?

Professional satisfaction: reduced professional isolation, morale, affect, peer review, respect
Financial security: length of consults, billings,
Quality patient care: patient satisfaction, evidence based practice, CPD

8. What do you feel are the benefits or rewards of supervising medical students?

Student qualities, student related activities student outcomes, university contributions

9. What do you feel are the disadvantages of supervising medical students? How do you or your practice minimise these?

Student qualities, student related activities, student outcomes, university demands
Change management capacity

10. Does supervising medical students affect your capacity to provide good patient care? If so how?

11. Are there circumstances that you can think of where you would not agree to supervise a medical student?

12. Anything else you want to add?
Tape off Debrief

Appendix 13: Student semi-structured interview proforma

Student …… Interview date…… Location…….
Confirmation that:
this interview will be taped and notes made
notes will be fed back to you for your review: feel free to alter or add
consensus document = data

Tape on

1. Tell us a bit about your current GP supervisor(s)?

2. What is your involvement with the doctors in the clinic?

3. Do you think the doctors are happy with this level of involvement? What has lead you to this conclusion?

4. The students are now (however far) through their attachment to the clinic
Please consider the last 4 weeks:
Can you describe in as much detail as possible how interact with your GP supervisor in a consulting session.

5. Is this a typical example of how you have interacted with a GP in a consulting session at this stage of your attachment?

6. What are your main professional objectives of the GPs in your clinic and how do you think you affect these?

7. Why do you think GPs are motivated to supervise medical students?

8. What do you feel are the benefits or rewards to GPs of supervising medical students?

9. What do you think are the disadvantages of supervising medical students? How does the practice minimise these?

10. Do you think medical students affect the GP's capacity to provide good patient care? If so how?

11. Are there circumstances that you can think of where you would not agree to being supervised by a doctor?

12. Anything else you want to add?
Tape off Debrief

Appendix 14: Publications during professional doctorate candidature

Walters L, Prideaux D, et al. What do general practitioners do differently when consulting with a medical student? Medical Education. 2009;43:268-273

Walters L, Worley P, et al. Do consultations in rural general practice take more time when precepting medical students? Medical Education. 2008;42:69-73

Walters L, Worley P, et al. The impact of medical students on Rural General Practitioner preceptors. Education for Health. 2005;18:338 – 355. Also available at Rural and Remote Health Journal 5. 2005:403. Available from http://www.rrh.org.au.

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