THE MEDICATION USE REVIEW

SERVICE (MUR):

A CASE STUDY FOR IDENTIFYING

E-LEARNING OPPORTUNITIES IN

PHARMACISTS' ON-GOING TRAINING

A thesis submitted in partial fulfilment of the requirements for the Degree of

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Acknowledgments

Clarification: All quotes used from the questionnaires results have been corrected for spelling and grammar.

Abstract

The aim of this research is to examine the role e-learning could have in the training of community pharmacists. The premise of the project is to suggest that e-learning could provide timely and flexible options for training so a sufficient number of trained healthcare workers are in place in time for the roll-out of a healthcare service. The Medicine Use Review (MUR) service, a publically funded medication adherence intervention, was used as a case study. The MUR is a service run from some community pharmacies which aims to support patients' adherence to a medication regime through advice and application of pharmaceutical expertise. This case study was of interest because there were problems in providing nationwide access to the MUR service in New Zealand and discontent with aspects of the training course.

The study design used two research tools; a case-study and two on-line questionnaires to answer the research questions. The two questionnaires were used in a nationwide survey about the MUR service and the MUR training. The first had dispensary business questions (DSQ) and the second had MUR training questions (CQ). The two questionnaires used closed ended questions for quantitative data collection and open ended for qualitative data collection. Community pharmacies from thirteen of the twenty District Health Boards (DHB) were faxed an invitation to complete one of the on-line questionnaires. Community pharmacists who had completed training for the MUR were invited to complete the CQ by the representatives at DHBs responsible for the regional pharmacy contract.

Seventy-five community pharmacists from across New Zealand responded to the survey. Results from both questionnaires included attitudinal responses to the usefulness of the MUR service, support offered for pharmacists to complete the training and their preferences for course delivery.

Cross tabulation of survey questions provided analysis of quantitative data based on dispensaries which offered the MUR service and dispensaries which did not. Over two hundred and

fifty text based comments provided qualitative data, which was analyzed by categorizing into subjects and frequency of concepts. Through triangulation with quantitative results, it was concluded that on the whole the pharmacists surveyed believed the MUR service was a useful service to offer their customers.

The Dispensary Service Questionnaire (DSQ) provided quantitative data which linked dispensary activity to the business decisions to offer the service and identified commonalities in the problems experienced by New Zealand pharmacists with pharmacists offering similar adherence service overseas. These included communication skills, the pharmacists' role in the primary healthcare team and remuneration for the service.

The number of responses received from the course questionnaire (CQ) was around the size of a group that might have participated in a course. Their preferences for training may have been influenced by the age ranges of this group; forty-seven percent were in the age group of 46 – 55 years old, although there was no statistically significant association found. It was confirmed by these respondents that networking skills and cultural competencies were considered to be important for future content of training. Peer networking both face-to-face and on-line was considered a useful method of delivering training.

A model called the Environment of Planning Training (EPT) was formed from the relevant literature and survey results. This model formed the basis for a discussion aimed to guide how the model could be used by stakeholders to identify factors driving the need for on-line delivery of the professional training content.

Conclusions from this research project are: e-learning for pharmacists has the potential to support value added services; further investigation is needed into the capacity of New Zealand pharmacists to participate in e-learning before it can be used effectively; evaluation of e-learning needs to be done in the context of the healthcare service evaluation and evaluation of pharmacist practice.

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List of Abbreviations – Terms and Concepts

AFLF   Australian Flexible Learning Framework

CE   Continuing Education

COLLES   The Constructivist Online Learning Environment Survey

CQ   MUR Training Course Questionnaire

CoP   Communities of Practice

CPD   Continuing Professional Development

CPP portfolio   College of Pharmacy Practice portfolio

CPPE   College for Postgraduate Pharmacy

DHB   District Health Board

DSQ   Dispensary Service Questionnaire

HMR   Homes Medication Review

ICT   Information and Communication Technology

IPPE and   Introductory Pharmacy Practice Experiences and the
APPE   Advanced Pharmacy Practice Experiences (United States based)

MTM   Medications Treatment Management

MUR   Medication Use Review – referred to both as the MUR and the MUR service.

NHS   National Health Service (UK)

NZPC   New Zealand College of Pharmacists

PCNZ   Pharmacy Council of New Zealand

EPT   Environment for Planning Training

SCLE   Social Constructive Learning Environment

ZPD   Zone of proximal development

Chapter 1
Introduction

This study began in 2008 after observing that the MUR (Medication Use Review) service was a topic talked about with frustration by healthcare professionals and members of a Health IT business. A pilot research[1] project on the effectiveness of a medication reminder aimed to use MUR enrolments in Canterbury as a collection point for research candidates. The problems being encountered in the MUR unfortunately made this impossible.

The Medication Use Review is a pharmacy based service that aims to improve patients' medication adherence, (Lee, Braund, & Tordoff, 2009 p. 27). Some of the problems pharmacists were encountering were, the level of remuneration for MURs, the process of referrals of patients to the service and the process of accreditation to perform the service. The views of the other stakeholders in the service on how these problems could be resolved seemed to be entrenched as well. The stalemate in resolving the problems contrasted with the enthusiasm and drive some pharmacists had for promoting the service to customers who needed medication adherence support.

Although the MUR service exists in a hierarchy of interventions to improve medication adherence, as a discrete, publically funded service it offers the opportunity to explore training issues. As a case study of a healthcare service therefore the MUR service lends itself to being a vehicle to collect data with the aim to describe the environment where training is planned and conducted.

Pharmacists represent a group of healthcare professionals who are essential for access to medications but are also associated by the public with the provision of a retail business. On-going vocational training for pharmacists as with other healthcare professionals is important for keeping

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[1]   The company, Chiptech went ahead with the pilot but used a different methodology than was originally planned.

their skills up-to-date and for maintaining professional registration.[2] Delivering a training course by traditional methods, such as seminars or workshops means pharmacists have to schedule these courses in so they can attend in person. There is the potential problem of time lag between funds for the service being made available and there being sufficient numbers of trained pharmacists to implement the service. Such a situation reduces the opportunity for the publics' access to the service, as in the case of the MUR service. The flexibility of e-learning potentially allows for vocational training courses to be delivered without the pharmacists traveling and could be accessed at a time more convenient to them.

Studies in New Zealand, the first by Lee et al., (2009) which surveyed MUR accredited pharmacists eighteen months after the service launch and the second, the ADMiRE report (2009) which reported on evaluation of the MUR pilot in Auckland District Health Board region, were both comprehensive studies and an excellent starting point for inquiry. Neither study, unlike this study looked at training specifically. Neither study made detailed solutions to the problems of the MUR service delivery but this may have been because it was at an early stage of implementation and there may have been an assumption that the service needed time to evolve. The MUR service has had two further years to evolve since these studies were undertaken.

Rather than concentrating on the negativity of the problems of the service, it seemed more constructive to assume the MUR service or a similar adherence medication service would still be provided in the future. From my teaching background I surmised, like all programme planning processes, training for the MUR service would have a level of complexity, compounded by the need for vocational relevance. As a tutor of English as a Foreign Language (EFL), I was aware of the impact e-learning was having on lesson options. From the case study the MUR service, it could be possible to identify which factors influence decisions to offer or use on-line delivery methods of training.

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[2]   CDP is through Enhance setup by the Pharmaceutical Society of New Zealand (PSNZ)
       http://www.psnz.org.nz/public/enhance/what_is_enhance/Enhance.aspx

Access to MUR course participants

The College of Pharmacists' was the sole accredited provider for MUR training. Access to the e-mail contact list of pharmacists who had completed the course was not granted at an early stage in this project. The issues around the MUR service and training for some pharmacists were controversial as seen in the swift reaction to invitations sent out to participate in this research project. Three pharmacists for example replied asking for information about who was funding the project. From these early responses it could be assumed because the research was being conducted independently of the organisations involved in the MUR service planning or training, the questionnaire provided an alternative forum for airing views; pharmacists responding might have felt less concerned about the consequences of the free text comments they made and how these comments were to be used.

Planning Vocation Training

A healthcare service is run in an environment of organisations, such as professional associations and funding bodies, with roles contributing to the provision of that service. Planning for training for the service should aim to accommodate not just the skills and knowledge needed but the impact these organisations may have on how the training can best be delivered. This is not to suggest that student learning needs should be ignored in the programme/course development but to consider factors, such as the support a learner will receive and the choices given to the employer for their involvement in the process. Here the course provider could work with the employer by indicating the way a course can be embedded into workflows of the organisation.

For the users of vocational courses, such as pharmacists, it would seem important to identify factors in their work place which impact on their motivation and access to the training. If the training is for a dispensary service over and above that which is considered standard then the pharmacy needs to offer the service before there is a need for the training. Therefore such factors as, funding for public health services and the pharmacists' role as part of the primary healthcare team which impact on the business model, also could impact on a pharmacists career aspirations.

Strategically, a value added dispensary service to customers, regardless of whether the pharmacy is a standalone business or a member of a franchise, needs to be supported by training which contributes to making the service financially viable. To participate in MUR training the pharmacy manager needs to be reassured the outcomes tie in with the financial feasibility of running the service as well as professionally meeting competency standards.

The potential for E-learning

The need for education providers to consider e-learning as an option is a result of developments in information and communication technologies. Jenkins used a definition, as cited in Bury, Martin, and Roberts, (2006) where "E-learning is learning facilitated and supported through the use of information and communication technologies'(p.24).The decision to use e-learning for content delivery of a pharmacy related course is made by the education providers working in this professional field. From this research it seemed evident for international continuing education for pharmacists, (as against undergraduate programmes) the most frequently used e-tools have been on-line simulations and on-line discussions. Also relevant to these planning decisions are issues about how the content fits in with competency standards set for the profession and how delivering this content via on-line methods might impact on students reaching these competency standards.

To date there has been no research into e-learning for community pharmacists in New Zealand; with considerable evidence that Information and Communication Technology (ICT) will impact on how they do business and access to further training, it is urgent that a starting point is found.

What content may be delivered via on-line tools and what factors may drive pharmacists' participation in on-line training are also important aspects of this inquiry. It is argued that to gain a useful understanding of this problem, a wider view is needed; a view that includes the other stakeholders in the MUR service environment. It is doubtful because of the silo nature of healthcare professions that an e-learning strategy would be formulated in New Zealand which can be applied to all healthcare professions. The contribution of this project will be to provide ideas for a possible e-learning strategy for pharmacists.

What is different about this project?

This project was different in that it did not aim to compare the MUR service to another medication adherence intervention, nor did it aim to compare the effectiveness of training delivered by traditional versus on-line methods. Instead, through the use of selected research tools, a non-linear pathway was found where literature and on-line survey data was collected. This data contributed to building up the case-study and provided a platform to hypothesise what role e-learning could play in future MUR training.

The structure of the Thesis.

All literature kept from the search is presented and critiqued in Chapter 3. The literature is presented in three sections and aims to give the reader an international healthcare context to the place e-learning could play in developing training courses for pharmacists in New Zealand, applied to the MUR service. While all the literature is presented in Chapter 3 before the Methodology in Chapter 4, this has not been done with the intention that the reader needs to acquaint themselves with it before gaining an understanding of the project itself.

Methodology is presented in Chapter 4, with details on the use of the on-line Questionnaires using Qualtrics, an online questionnaire application. Chapter 5 presents the results from the eighty-five pharmacists who responded to the questionnaire survey. It was decided by the researcher the most useful way to utilise the results and answer the Case-Study question was to describe a Model of the Environment for Planning Training (EPT). This allowed for a discussion in Chapter 6 on possible uses of e-learning for the training provider and pharmacists as users of the training. There are many other stakeholders in the MUR health service environment and possible uses of the EPT model are identified in relation to interprofessional training. The role of evaluation concludes the discussion as its importance cannot be dismissed. Taking a healthcare service wide view before setting performance indicators[3] for on-line training would be vital to establish its effectiveness.

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[3] (www.**apho.org.uk**/resource/view.aspx?RID=44584)

Chapter 7 provides recommendations and conclusions and Chapter 7.1 suggests future research

directions for this important contribution to primary healthcare sector training.

Chapter 2
Project Goals, Scope and Research Questions

Finding solutions to the problems stopping universal access to the MUR service in New Zealand and evaluating the existing training course were two important aspects warranting further research.

The project aim was

'*To identify from a sample of community pharmacists, factors considered important in providing the Medication Use Review (MUR) service and attitudes and preferences for continuing professional development within their current work environment.*'

To achieve flexibility in training for a healthcare service, e-learning would most likely be used. To maximize the usefulness of the MUR service as a case-study though, the scope of this project was set on future training for the service. The research objectives therefore became more focused on the need for flexibility of training for the service. Through analysis of the MUR case-study the aim was to provide a description of the environment in which the planning for training is done. This concept is based in programme planning theory. In a conference presentation Warren (nd) laid a path through a detailed landscape of planning theory and claimed contemporary programme planning was more process focused than product focused. 'Planning has moved from the realm of the educator working in a vacuum of sorts isolated from external factors to change a learner's behavior into the realization that many factors influence the educator, learner, and sponsoring organization and that while all negotiate toward intended outcomes there are also unintended outcomes which must be acknowledged in the process' (p.6). In this case-study on the MUR the planning training environment is used to refer to the many factors the different stakeholders have in their work, including responsibilities, decisions and competing interests that impact on the planning for training. Some of these factors can be considered drivers for the use of on-line learning.

The question to be answered from the case study was:

'What factors in the New Zealand MUR service environment drive the need for e-learning in the planning of MUR training?'

Primary data from surveying a part of the population of New Zealand community pharmacists and secondary data from relevant literature was needed to describe the MUR service. This description aimed to show how the MUR service is placed in the New Zealand pharmacy sector and to describe the components that go into making it a local primary healthcare service. This required quantitative data because offering the service is a business decision made by pharmacy management, including the head of dispensary. Qualitative data was also needed and was collected through open ended questions, as the relationships between the stakeholders in the service and factors important in training for the service delivery were explored rather than tested or compared. This data constituted the bulk of the inquiry.

Below are listed the research questions grouped into three, with a reference to the section where they are addressed.

2.1 Research Questions

2.1.1 Specific research questions for the Case Study
- How does the MUR service fit into medication adherence interventions? (3.2.3)
- How is it funded? (Budgen, p. 17)
- What barriers to operating the service are there? (Figure 9, p. 84)
- What components make up the service? (5.4.2)
- What reasons are there for not offering the service? (5.3.2)
- What commonalities does the MUR service in New Zealand have to similar services internationally? (3.2.2)
- What evaluation of the MUR or similar services has been undertaken? (3.2.4)

2.1.2 Specific research questions about the role of pharmacy in the MUR service
- What importance is placed on the MUR fee in overall pharmacy business? (5.3.3)
- What factors can be identified that go into decision to offer the MUR service? (5.3)
- What attitudes do pharmacists have to the value of the MUR service? (Figure 6, p.73)
- What type of support do pharmacists receive for training? (5.5.3)

2.1.3 Specific research questions on pharmacist training and preference for training methods.

- What date did the pharmacists gain accreditation? (5.4.3)
- What skills are needed to perform an MUR? (3.2.5 and 5.5.4)
- What e-tools have been used in the training of post registration pharmacists? (3.4)
- What attitudes do pharmacists have to the value of the existing MUR training? (5.5.2)
- What preferences do they have for training delivery methods? (5.5.4)

2.2 Scope of Inquiry

There was a need early on in the project to put boundaries to what could be achieved so the

scope centred around a focus on training. The research design was therefore based on the following

exclusions and limits of inquiry.

- The primary data was to be used for largely descriptive purposes so respondents could remain anonymous to the researcher.
- The research question was about the training so the views and opinions on the MUR service were from the service providers.
- The research design therefore did not include input from patients, an important stakeholder in the MUR service, on the success or failure of the service.
- No in-depth data was needed on individual pharmacy business decisions in terms of planning, costing and consultations with stakeholders before accepting or declining the DHB offer to provide the MUR services.
- No questions on the details on specific administrative or communication processes involved in the MUR service were asked.
- No distinction was made in the survey questions between Continuing Education (CE) and Continuing Professional Development (CPD).
- As the training course was based on a core set of competencies, it was assumed there was little variation in what was presented for the different training sessions.

Chapter 3
Literature Review

3.1 Introduction

The literature review presents literature chosen and critiqued for its contribution to defining the case study, the role of e-learning in the workplace and e-learning specifically for post-registration pharmacists. The literature review formed an important part of the research strategy as literature on the MUR and medication adherence was needed to build up the description of the case-study. The inclusion/exclusions criteria and search strategy can be found in Table 3, page 57. The literature is presented in three sections.

In the first section of this review, literature from both international and New Zealand sources was chosen to: identify the problems the MUR service and similar services have had, identify the key stakeholders involved in offering the services and identify the skills and areas of knowledge needed to perform it. How this body of literature fits into the Methodology is shown in Figure 5, page 57. A summary of this literature can be found in the Table 1, page 13. This includes information on the contribution to the description of the case study, authors, date of publication, associated education institution(s) and journal name. There were unfortunately no studies specifically on MUR on-line training, a gap showing the need for this study.

The second section of this chapter presents literature which showed the possibilities of e-learning for the workplace. This literature was selected because it showed the developments of education theory that provided a foundation for effective use of Information and Communication Technology (ICT) for on-line or e-learning delivery formats. The literature had to be about healthcare post-graduate training, predominantly pharmacy.

The third section refers to current literature about specific on-line, distance learning tools. This collection while focusing on what has been on offer to post-registration pharmacists does include studies on e-learning for undergraduate pharmacists and healthcare professionals as a collective.

3.1.2 Literature Characteristics.

To summarise this collection, articles were sourced from thirty nine journals. Most articles were retrieved from the University Canterbury's on-line search facilities, although some were searched directly and were open access. Of the sixty-seven articles, the following online databases were used. EBSCO – 28, Pubmed – 20, Other – 19. EBSCO[4] itself is a collection of databases. The education and/or health sciences options were selected in these searches. There were fifty-four studies, seven reviews and sixteen articles of other types. Three studies were in an on-line format and four were books. Subjects for the Journals accessed were mostly in Pharmacy content but also included General Medical and other Healthcare Professional Journals, Distance Learning, and Health Informatics. Fourteen articles were from two journals, American Journal of Pharmaceutical Education (7) and Pharmacy Education (7). The articles were from a wide variety of countries. These were Canada, Brazil, Switzerland, the United States, Australia, Poland, United Kingdom, Finland, Qatar, Thailand and New Zealand, suggesting the issues concerned are of a global nature.

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[4] http://www.ebsco.com

3.1.2 Literature collected on MUR service, and the MUR training course

The literature collected to describe the Case-Study included fourteen articles. These are presented in Table 1 below.

Table 1 Literature collected on MUR service, and the MUR training course.

Contribution	Author(s)	Date	Journal	Type of literature	Education Institution Associated	Source and date of retrieval.
International Context. An equivalent service to the MUR and its place in the Australian healthcare service. Reviewed adherence interventions from literature 2000-2009 and surveyed Australian Pharmacy Institutions about initiatives to introduce an adherence component in undergraduate programmes.	Aslani & Krass.	2009	*Pharmacy Practice (Internet)*	Literature Review and Survey of Pharmacy Schools	University of Sydney, Australia	Feb 2010 EBSCO
Background information on MUR service components and examples of research questions for this study.	Brandt, Harrison, Sheridan, Shaw, & Jensen,	2009	*Uni Service Ltd.*	Report on Evaluation of ADHB's MUR pilot.	University of Auckland, New Zealand	May 2010 EBSCO
Overview of the New Zealand primary health care strategy, issues on medication adherence and hierarchy of pharmacy interventions possible.	Budgen.	2005	*Pharmaceutical Society of New Zealand Incorporated.*	Presentation by President of PSNZ at that time	New Zealand	June 2010 Google Scholar
Provided a classification of business models for community pharmacy based on the flexibility of the organization to build capacity for value added services.	Feletto, Wilson, Roberts, & Benrimoj.	2010.	*Pharmacy World & Science.*	Qualitative study – semi structured interviews in 30 pharmacies.	University of Sydney, Australia	Feb 2011 EBSCO
An current analysis of how the views of New Zealand pharmacists' match those of the '10 year vision document' by the Pharmacy Action Group (see below)	Harrison, Scahill, & Sheridan,	2012	*Research in Social and Administrative Pharmacy.*	Report on a study: a postal survey and focus groups on attitudes to 12 vision areas.	School of Pharmacy, University of Auckland.	Jan 2012 Science Direct

Contribution	Author(s)	Date	Journal	Type of literature	Education Institution Associated	Source and date of retrieval.
Focused and comprehensive insight into the current United Kingdom debate on the evidence of success of MUR as an adherence intervention with reference to government policy and funding.	Holland, Smith, & Harvey.	2006	*Journal of Epidemiology and Community Health.*	Editorial – presenting and offering opinion on five years of trial evidence the MUR impact on health indictors in United Kingdom.	School of Medicine, Health Policy and Practice, University of East Anglia, Norwich, United Kingdom	May 2011 Pub Med
A United Kingdom study on the equivalent MUR service there. Comprehensive background to possible issues for New Zealand based pharmacists working with the MUR. Long list of attitudinal statements used in the questionnaire.	Latif, & Boardman.	2008	*Pharmacy World & Science.*	Survey based study using a questionnaire.	Division of Social Research in Medicines and Health, University of Nottingham,, United Kingdom	May 2011 Pub Med
A key study to getting results of what had been achieved in the first year of operation of the MU in New Zealand. Setting expectations for possible results. Identification and confirmation of stakeholders in MUR healthcare service environment.	Lee, Braund, & Tordoff,	2009	*The New Zealand Medical Journal.*	Report on a questionnaire-based cross-sectional survey of MUR accredited pharmacists.	School of Pharmacy, University of Otago, New Zealand.	May 2011 Pub Med
Comprehensive description of a pharmacy service similar to the MUR and stakeholders in that service. A full description of interprofessional training via blended learning with an evaluation of this.	Leikola, Tuomainen, Ovaskainen, Peura, Sevón-Vilkman, Tanskanen, & Airaksinen,	2009	*American Journal of Pharmaceutical Education.*	Article describing development and evaluation of a blended training programme for Comprehensive Medication Review.	University of Kuopio and University of Helsinki, Finland.	Jan 2011 Pro Quest

Contribution	Author(s)	Date	Journal	Type of literature	Education Institution Associated	Source and date of retrieval.
Evaluation of pharmacists' barriers to the implementation of medication therapy management services. (MTM)	Lounsbery , Green Bennett ' & Pedersen	2009	*Journal of the American Pharmacists Association Issue.*	Cross-sectional Study	College of Pharmacy, University of Minnesota and Ohio State University, Columbus.	Dec 2011 Pub Med
A theoretical article which provides an alternative perspective on the link between the skills need in the MUR and those that the pharmacist would have been trained for. Even though the service was different, the core skills being described were the same.	McGivney, Meyer, Duncan-Hewitt, Hall, Goode, & Smith	2007	*Journal of American Pharmacy Association.*	Commentary article	School of Pharmacy, University of Pittsburgh, United States	Feb 2011 Pub Med
A vision document for the industry that identified factors in the New Zealand healthcare environment which would impact on the way pharmacists work and strategies to reach these goals. The ten-year vision consists of 24 vision statements covering 12 key areas.	Pharmacy Sector Action Group	2004	*Pharmaceutical Society of New Zealand.*	Strategic document for Industry		Nov. 2010 Google Scholar
International Context. A comprehensive description of a similar adherence service in Switzerland. Study results were critical of pharmacists and the training methods used. The collection of research tools was varied and the description and subsequent model provided a useful breakdown of skills needed for the MUR	Niquille, Lattmann, & Bugnon	2010	*Pharmacy Practice.*	Qualitative survey of components of a service - the prescription and drug utilization review, - a patient interview - pharmaceutical report - the physician's	Universities of Geneva and Lausanne Switzerland.	Dec 2010 Scopus

Contribution	Author(s)	Date	Journal	Type of literature	Education Institution Associated	Source and date of retrieval.
				observation of training.		
This offered a useful model for medication adherence interventions for older adults.	Ruppar, Conn, & Russell.	2008	*Research and Theory for Nursing Practice.*	A systematic review	University of Missouri and Columbia University	Jan 10 Pub Med
International Context. An exploratory description of the operating issues facing pharmacists as a profession in 'high income' countries, including New Zealand including the changing role of the pharmacist and the need to offer a value added service such as the MUR.	Scahill, & Babar,	2010	*Southern Medical Review.*	Editorial	University of Auckland	Nov 2011 EBSCO

* See Reference section for full citation

3.2 The Case Study – The Medication Use Review

3.2.1 Introduction

The literature presented here aims to provide a case study of the MUR service in the context of a publically funded service within the primary healthcare sector of New Zealand. Before being able to apply e-learning theory to the MUR service, details about the service will be presented by critiquing current literature. The key argument for using the MUR as a case study is as follows: The environment in which a healthcare service operates needs to be understood, so factors which will affect training can be identified. It should be possible to identify where training needs may arise in this environment. Ideally the relevance and usefulness of skills healthcare workers receive in a training course will remain into a medium term future. If information on factors such as new procedures, regulations or funding are readily available but not taken into consideration when designing a training programme, then parts of the training will not be relevant and possibly redundant. The case-study literature is presented in five sections. These are:

- What the MUR is.
- Why a pharmacy intervention.
- The problems encountered in the New Zealand MUR roll-out.
- Training to provide the MUR service.
- CPD and Life-long Learning

3.2.2 What is the Medication Use Review?

The Medication Use Review (MUR) is a ' pharmacist-led, structured, systematic, consultation-based review of a patient's medication. It involves reviewing a patient's medications, identifying any practical or medication-related problems, and educating the patient about their medicines' (Lee et al., 2009, p. 27). Similar services are offered in most developed countries such as Australia, the United States, and European Economic Community (EEC) countries. In the United Kingdom a similar service is also called the MUR service.

The service is more than a face to face consultation between a pharmacist and a person about their medications. Budgen, (2006) in a presentation in New Zealand before the launch of the MUR, identified the four parts of this pharmacist intervention. These were:

- *'Identifying patients for MUR*: Problems identified in the pharmacy, family concerns, doctor referral, Care Plus.
- *Assessment*: Assemble patient, documents, medicines and then interview (interpreter?)
- *Implementation*: Medicines solutions, compliance aids e.g. trays, blister packs, own system? Information/education, Yellow Card. Follow-up interview
- *Report back & follow up*: Report to GP, add patient into calendar, follow up reviews (2/12months), Electronic monitoring and health status reporting.' (**Modified format from slide 12 with content left mostly as original**).

The goals of the service demonstrate how national healthcare policy and funding arrangements drive public healthcare initiatives. *The National Framework for Pharmacist Services (1)* brings both the *Ministry of Health's Primary Healthcare Strategy (*2) and the clinical governance of the pharmacy profession by the *Pharmacy Council of New Zealand* (3)[5] together by identifying changing national and international patterns of healthcare and instituting standards and targets for healthcare services from these. Bugden (2006, slide 3) identified the international factors the MUR initiative was responding to as;

- the burden of chronic diseases on the State funded healthcare systems,
- the minority of patients consumed the majority of resources,
- the need to keep people well and productive in the community,
- the need to manage chronic disease states in a systematic way to maximise return on public health dollar investment.

Funding for the MUR service was channeled regionally through the District Health Boards (DHB), with a contract to a selection of pharmacies in the region that the DHB was responsible for; remuneration was for each MUR completed rather than a set amount for the service. The decision to offer the service therefore rested with:

i.   the DHB. Funding the service needed to be seen as a priority within health goals for that

DHB region.

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[5]

http://www.dhbnz.org.nz/Site/SIG/NPSF/Default.aspx
http://www.health.govt.nz/our-work/primary-health-care
http://www.pharmacycouncil.org.nz/cms_display.php

ii.   Individual pharmacies in that region as to whether the service fitted in with business strategy within the community or location it operated in.

Support and advice for the administrative processes involved in the service was offered after the initial training from the Pharmacy Guild of New Zealand. These initiatives could be seen as a response to accusations in on-line forums such as Pharmacy Today [6] that the documentation process was burdening the overall service. This accusation was confirmed in the ADMiRE Report(Brandt, Harrison, Sheridan, Shaw, & Jensen, 2009, p. 65). It is not known if all pharmacists doing MURs used the DHB templates directly. These documents show how much paperwork is involved documenting each MUR case. There is a comprehensive form for the MUR per patient and a summary report of all MURs completed within a period of time. These templates can be found in Appendices A.

A company called Ulearnncare Ltd offered similar guidance on its webpage, Medicines Check[7] which was endorsed by the Pharmaceutical Society of New Zealand Inc (PSNZ). This product is a commercial venture; it was also being piloted in the United Kingdom where the MUR service operates on a much larger scale. It caters for pharmacists and other stakeholders in the MUR service, including patients, providers (DHB) and the funder (Government).

3.2.3 Why a pharmacy intervention?

Promoting adherence is an integral strategy for improving health outcomes; according to World Health Organisation (2003) 'Adherence to long-term therapy for chronic illnesses in developed countries averages 50%. In developing countries, the rates are even lower' (p. XIII). There is an array of possible intervention points available to healthcare professionals during a patient's health event, where the success the patient has had in adhering to a medications strategy, can be supported

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[6]   http://www.pharmacy-today.co.nz/
[7] http://medicinescheck.com/aboutus.html

and monitored. Community pharmacists' dispensing role means the public have easy access to a medical professional with extensive pharmacological knowledge.

The push by healthcare systems to utilise pharmacists' extensive knowledge on a clinical level is impacting on the profession. A study in Scotland questioned pharmacists, by using a discrete choice experiment to focus 'on marginal willingness to pay for individual attributes and where a discrete change in an attribute was unlikely to alter the choice probabilities' (Scott, Bond, Inch, & Grant, 2007, p. 791).Thankfully the authors went on to give a straightforward explanation of this methodology. The reason for the study was given as a service contract was being introduced at that time in 2006. This contract defined roles for pharmacists that encouraged integration with other primary healthcare workers, including participation in a medication management service both onsite at pharmacies and at the GP surgeries. The importance of trying to capture these preferences as measureable outcomes through a quantitative process was useful. Pharmacists in this sample were offered the choice between either having both some level of integration with a primary healthcare team and being able to offer advice on medication and health, or just to continue in the dispensing role. The results concluded they were willing to receive less income to realise the first choice.

This move to have a greater role in adherence advice is international. In Australia Aslani and Krass (2009) surveyed tertiary institutions about adherence content in pharmacy programmes and also collected literature on adherence initiatives by community pharmacists in Australia. Results found that while healthcare training initiatives were evaluated as successful, there had been no evidence the interventions were reducing health related costs, although it was suggested further research was needed. The reason for this doubt found in the studies reviewed was the need to maintain an intervention. 'Although these studies have shown a positive impact of the interventions on medication adherence as well as various health outcomes, the long term (more than 12 months) impact of these interventions is unknown ….'(Aslani & Krass, 2009, p. 5).

Finding evidence for positive outcomes from interventions is an issue. Holland, Smith, & Harvey (2006) stated in an editorial in the Journal of Epidemiology and Community Health any '….

intervention delivered by professionals not primarily responsible for prescribing decisions, should

be considered in the same way as other health technologies and be expected to adequately

demonstrate not just effectiveness but also cost effectiveness. ..'(p. 92). Getting this evidence is

however difficult; even the selection of a definition of adherence for a trial impacts on how

outcomes of that trial can be interpreted. In general terms, adherence can be defined as 'the extent

to which a patient's behaviour coincides with medical advice, including the dosing and instructions

specific to medications' (Eldred, Wu, Chaisson, & Moore, 1997; Haynes, 1979), as cited in Halkitis

& Palamar, (2007, p. 36). But as the study by Choudhry et al., (2009) and the review by Andrade,

Kahler, Frech, & Chan, (2006) suggested, how adherence was defined and measured and the

purpose of the intervention needed to be clearly articulated if comparisons with other studies were

to be possible. A more specific definition was used by Ruppar, Conn, & Russell (2008) in their

review of studies describing interventions which promoted medication adherence for the elderly.

This definition claimed adherence included 'procuring the medication; administering the correct

drug, dose, time, and route; and persisting with taking the medication as long as the medication is

necessary' (p.115).

The complexity of medication adherence and the long list of behaviors that can be associated with it

were conveyed by the arrangement of adherence interventions into a formal hierarchy. Often a

healthcare service with a medication adherence component would include a cluster of interventions.

For pharmacists this hierarchy was described by Lee et al., (2009) as:

'• Level 0, ad-hoc review: an answer to an isolated question on a patient's medicines.
• Level 1, prescription review: a technical review of a list of a patient's medicines in the presence of the patient but without access to the patient's clinical notes.
• Level 2, treatment review: a review of a patient's medicines without the patient present but with access to the patient's clinical notes.
• Level 3, clinical medication review: a review of patient's medicines in the presence of the patient and with access to the patient's clinical notes' (p. 27).

There was little evidence evaluations of the MURs had been done in New Zealand, either by

DHBs or by the PCNZ. This contrasts with the UK where there was an audit cycle for participants

in the MUR service. [8] This audit cycle also involved patients with results reported as positive for

patients' willingness to make changes to the medication adherence as suggested by pharmacists. It

was not noted if the patients were self-selected in the audit. [9]Also Dr. Delyth James from the Welsh

School of Pharmacy[10] published several papers evaluating aspects of the MUR service in the United

Kingdom.

3.2.4 The track record of the Medication Use Review service in New Zealand and internationally

The introduction of the Medication Use Review in 2007 in New Zealand has demonstrated how

problematic getting national coverage can be for primary health services. Problems encountered

with the MUR are not unique to New Zealand. Barriers to providing the Medications Treatment

Management (MTM) service, a similar but more comprehensive service to the MUR, were the focus

of a cross-sectional study by Lounsbery, Green, Bennett, & Pedersen, (2009) in the United States.

Both funded and non-funded pharmacists completed an online questionnaire about service barriers

which had thirty questions on the following topic areas;

- components of the service,
- pharmacist concerns,
- interprofessional relationships,
- patient care,
- management,
- documentation,
- Compensation. (p.52)

Compensation, interprofessional relationships and documentation were considered significant

barriers for the study participants (Lounsbery et al., 2009, p. 58), which were factors also

considered barriers for pharmacists offering the MUR in New Zealand. The two contexts differ

though. This United States study targeted pharmacists working in the outpatient setting, which is

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[8] http://www.qi4pd.org.uk/index.php/Medicines-Use-Review-Audit.html
[9] http://www.thepharmaletter.com/file/47621/first-results-of-uk-national-medicine-use-review-audit-show-benefit-of-murs.html
[10] http://www.cardiff.ac.uk/phrmy/contactsandpeople/fulltimeacademicstaff/james-delythnew-publications_new.html#_blank

not the same as community pharmacists and the sample group was selected from databases for five large federal pharmacy organisations. There were 970 respondents which was 6.7 % return on emails sent out. The response group was divided into three; pharmacists being compensated and those not being compensated and those which would like to have offered the service. Having a questionnaire that could accommodate these three groups and which would establish any meaningful relationship would seem challenging. Barriers to implementing the MTA were the variables used in analysis. The authors claimed for all three groups the most significant relationship was between the lack of compensation and access to patients' notes.

A similar experience to New Zealand pharmacists' experience of a medication adherence service was described in a cross-sectional study in Switzerland by Niquille, Lattmann, & Bugnon, (2010). Pharmacists were recruited from a virtual chain of pharmacies in French speaking Switzerland. Fourteen pharmacists were included in final total. The authors attributed this low participation level to pharmacists' motivation. The study was very comprehensive and tracked qualitatively the process the study participants took in performing a medication review, including the frustrating process of recruiting patients to be reviewed; 85 patients of the original 738 were left after physicians gave approval for their MUR consultations. Lack of collaboration with primary healthcare team, mainly the physician, was noted as a significant barrier. Also considered a significant barrier was the pharmacists' lack of confidence in their role in dealing with physicians. Figure 1 summarises the problems and suggestions the authors made for improving the process of conducting a Medication Review.
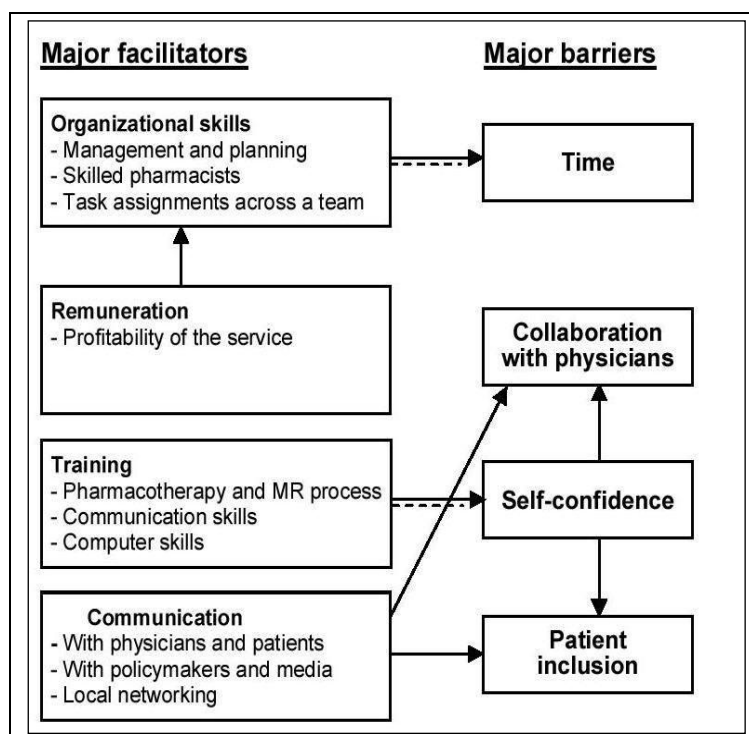
Figure 1 Suggestions on how to overcome barriers in a MUR service.
Contributing factors to improving a MUR service as suggested by Niquille
et al., (2010 p 40) Suggestions were grouped by the contributing factors of
Organisation skills, Remuneration, Training and Communication with the
aim of overcoming identified barriers to participation; enhancement,
potential contribution of external support.

The authors also referred to 'Seven-Factor Solution' (Roberts, Benrimoj, Chen, et.al, 2008) as cited in Niquille et al., (2010) medication reviews relied on the following factors:

- good relationship with local physicians,
- remuneration for each pharmaceutical service delivered or in an implementation phase,
- an area specifically designated for services within pharmacies,
- patients' expectations regarding such services,
- sufficiently well-trained staff,
- communication within the team, and
- finally external support/assistance with clinical aspects and/or implementation.6-7' (p.36)

In New Zealand the barriers of funding, time and paper work were identified early on in the service's roll-out by Lee et al. (2009). The questionnaire-based cross-sectional survey has been the only other specific national research study on the MUR service. Their study was useful as it did

provide bench mark statistics for components of the service, such as the average length of time for a MUR interview, which was just under an hour at 57 minutes. It could have been too early to evaluate the service as the authors claimed; one year may not have been a sufficient length of time for the contracted pharmacists to have made it function effectively. However, the same problems were still being talked about in 2010, eighteen months later when this research project started. Eleven of the twenty DHBs funded some form of MUR, with pharmacy groups within the eight DHBs having actively made it work.[11]

The problems with funding were indicative of the healthcare environment that the New Zealand pharmacists worked in. Scahill and Babar (2010) in an editorial for the Southern Medical Review described the funding model for community pharmacists in wealthier countries such as New Zealand. These pharmacy services are funded through public healthcare system and the following quote applies to the MUR as well, 'The nationally set dispensing fee does not support wide spread implementation and integration of these services; nor does the small pockets of regionally controlled money ring fenced by District Health Boards (DHBs). Therefore, it is the retailing side of the pharmacy business that subsidises these extended services, by those pharmacy owners who chose to adopt them' (p. 1). This article captures the dilemma of the pharmacy caught between the culture of retailer and primary healthcare provider. Interestingly this problem is only for pharmacists in developed countries; the challenge for pharmacists in the developing countries within a primary health care role is to reach standards of training and maintenance of good practice in handling medications

Latif & Boardman, (2008) identified similar barriers in the United Kingdom's version of the MUR service, which had been in operation since from 2005. The aim of the study was to collect pharmacists' opinions on the service to establish possible reasons for the levels of MURs completed

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Not all DHB call the medication adherence service MUR – for some it is repackaged into existing services.

by pharmacists. While this was a comprehensive study using a questionnaire, it targeted pharmacists in one pharmacy chain which could mean the results may not be completely representative. Both time to do a MUR and compensation received were factors which contributed to the lower number of pharmacists being accredited to offer the service and for the number of MURs completed; factors such as 'gender, length of time qualified, having a clinical diploma and the size of the pharmacy worked at did not affect the numbers of MURs performed' (p.539).

3.2.5 Training for the MUR service

The New Zealand College of Pharmacists (NZPC) had the sole contract to provide training for the MUR service. The course content was developed from the competency standards set by the Pharmacy Council of New Zealand (PCNZ). This set of four competences can be found in Appendix A. Funding for training was on a regional basis and from 2007, weekend courses were offered in most DHB regions until 2009, after which they were held if sufficient numbers of pharmacists were interested in attending. A pharmacist could attend the course in any of the centers in which it was offered as funding for the course was not tied to a region. While the weekend seminar part of the training was well attended, the distance part of completing the case study proved a challenge.

Enthusiasm to complete the training was, perhaps as suggested by Lee et al., (2009) because 'pharmacists perceived the service as being highly valuable or valuable to patients' (p. 33). Brandt, Harrison, Sheridan, Shaw, & Jensen, (2009) found a comparable Health Monitoring Service (HMR) in Australia was received with similar enthusiasm because it was seen 'as a professional and career development opportunity and several female pharmacists cited flexible working hours and possibility of part-time employment as additional reasons'(p. 23).

There were problems with the length and complexity, (referred to by the College as teething troubles) with the accreditation process. The accreditation process was done by distance after attending the training course and involved the write up of an actual MUR as a case study.[12]

As an employee a pharmacist's motivation to participate in the MUR training course in part can be attributed to their career aspirations but also depends on the nature of the professional development arrangement with their employer; whether they pay the course fee themselves and/or attend in their own time. Whether they are full-time, part-time or locum would influence how on-going training is supported by their employer. Collecting and updating skills and knowledge for on-going pharmacists' professional development needs to be more than responding to the necessity of maintaining registration with the PCNZ. It could be suggested that the skills gained from participation in the Continuing Education courses are more likely to be used in practice, if the pharmacist as employer had decided participation was also good for the business.

It would be logical to conclude that an important factor in deciding to complete the MUR training would be if the pharmacy intended to offer the service. The decision to offer any non-core dispensary service arises from the business model being used by the pharmacy.

To be involved in the management of a pharmacy dispensary, a pharmacist needs to be registered; rules for owning a pharmacy include the requirement of a registered pharmacist as a majority shareholder in the business. Managing the mix between the dispensary income and retail income becomes a strategy between dispensary managers and pharmacy manager. It could be assumed there might considerable tension with the need to keep the business financially viable and the need to provide a dispensary service that is more than distribution of pharmaceuticals. (Scahill and Babar, 2010).

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[12]

(see *Outcry over MUR accreditation*, Pharmacy Today).

The factors impacting on the pharmacy business models were described in the 'Ten Year Vision' (TYV) document, a strategic document compiled by an industry collective called Pharmacy Sector Action Group (2004). This included a vision statement for greater use of pharmacists' expertise and the use of new technologies. Training of staff is an on-going process. With the introduction of new technologies and the associated need for skills training, it could be assumed that there would be opportunities to use new technologies for delivery methods of the training also.

McGivney, Meyer, Duncan-Hewitt, Hall, Goode, & Smith., (2007) while not a research study, compared Medications Treatments Management (MTM) with existing pharmacy services in the skills needed and then suggested how these could be distinguished from the core business. By recognizing these services as being more than the core business of pharmacy, management needed to be strategic in how they operated these services. Feletto, Wilson, Roberts, & Benrimoj, (2010, p. 133) went further and offered a way to categorized pharmacies by the strategy used to run the business. These categories are presented in Table 2 below.

For a more cognitive service like the MUR, the pharmacist bidding for a contract would ideally be prepared to resource it adequately, play the role within the primary healthcare team and advertise the service to their patient base. A deliberate strategy would be needed to ensure the success of the service.

3.2.6 CPD and Life-long Learning

Professional Development is vital for any career path as well as being the vehicle for maintaining skills and knowledge relevant to current practice and work needs. After graduation, keeping up to date with the constant changing drug and pharmacological information and other industry developments, is through Continuing Education (CE) or Continuing Professional Development (CPD). New Zealand accreditation and the further training framework is administered by Pharmacy Council of New Zealand. This organisation also provides accreditation of training providers for pharmacy courses and the tool for registering and participating in CPD, which is called ENHANCE.

Over the past decade the PCNZ and comparative organisations in other countries have been dealing with both, the way courses can be delivered and how participants can be supported. These pressures are a result of the need to move to CPD from a CE framework. Driesen, Verbeke, Simoens, & Laekeman, (2007) suggested the two systems differed in that 'CPD is focused on the

Table 2 Organisational flexibility in community pharmacy
(Feletto et al. 2010 p 133)

Type of flexibility	Manifestation in community pharmacy
Steady-state	Pharmacies existing in "steady state" have not changed their practice significantly to incorporate service or alter their existing business model in any other way. This type of pharmacy is characterised by its complacency to the external environment and uncertainty in regards to the future. The business model for this type of flexibility is classic community pharmacy.
Operational Flexibility	Pharmacies with operational flexibility can be characterised by an emphasis on providing products and services to customers quickly and efficiently. As a networked pharmacy, they form part of an informal network of pharmacies in a close geographical area and cater to various target markets. As a retail destination pharmacy, they increase their physical capacity and product range to draw customers based on their retail offering.
Structural Flexibility	Pharmacies exhibiting structural flexibility have extended the conventional pharmacy product/service offering by flexibility developing services in a few key areas and making the necessary structural changes to implement these services, for example including introducing new facilities for services. This type of pharmacy is characterised by structure changes but this is often in the absence of any link to overall business strategy. Some health care solution pharmacies use this type of flexibility.
Strategic flexibility	The owners of pharmacies exhibiting strategic flexibility take a proactive approach to managing their business. They use the support functions to free the pharmacist time for the provision of services, but they maintain a high level of involvement in all facets of the pharmacy's operations. This type of pharmacy is characterised by its focus on integrating its product/ service offering with the overall image of the pharmacy and supporting this through effective internal practices. This type of flexibility was manifested in both the health care solution pharmacy and networked pharmacy.

individual practitioner; CE is structured to address the learning needs of the majority of practitioners' (p.1). Reflecting on learning and assessing one's own learning needs are important in CPD. Namara, Duncan, McDowell, & Marriott, (2009) suggested however the 'substantial dispensing burden that many Australian community pharmacists endure may also impede their ability to reflect on their learning or convert educational experiences into practice outcomes' (p.56).

Swallow, Clarke, Iles, & Harden, (2006) from Northumbria University, Newcastle upon Tyne, examined in a qualitative study the use of portfolios by pharmacists in developing their professional practice. In the United Kingdom since 2001, as part of the requirements to maintain registration,

pharmacists can use a designated portfolio (CPP) purchased from the College of Pharmacy Practice. This is used to record reflections on their practice, dialogues with employers present and past, and for a record of transactions with the college regarding membership. (p.78). The study looked at how the portfolio tool supported the need for reflective practice and socialized learning needed for CPD. Nine pharmacists from National Health Trusts were interviewed before and after the use of portfolios in CDP. An electronic version of the CPP was available, although no distinction was made in the study between those participants using a paper or electronic version. Two relevant results from study included the need to have clear leadership in CDP activities and the need to bring a focus on the process of reflective practice. Some pharmacists, mainly those that had not had much experience of CDP, saw the use of the portfolio as a way to collect mandatory evidence needed for registration purposes rather than using it as a learning exercise. (Swallow et al., 2006, p. 87). Interestingly the portfolio activity gave the participants the opportunity to reflect and comment on the occasions when they felt they had not been supported by employer organisation. It was suggested that the process would work against learning which should be social and ideally take place within the work group.

Rouse & Maddux, (2010) presented the model in the Journal of American Pharmacy, shown in Figure 2 from the Council of Credentialing in Pharmacy (CCP) in the United States. This 'framework provides a roadmap for the CPD of pharmacists, regardless of where and how they choose to practise, by articulating a conceptual structure that is competency based, covers the major domains of pharmacist practice, and considers patient and societal needs' (p.344).This three dimension model works on quadrants that have been developed to show how training pathways can be mapped. Pharmacists place their learning need or course in the appropriate quadrant. It is presented here as it could be useful to pharmacists who are mapping a pathway for their professional development rather than following the necessary regulatory requirements.

A course like the MUR could be said to be located in the C quadrant. It is more on the left side of the v axis because it enhances the patient focus compared to the normal customer services they

would receive. On the z axis it would be nearer to the front because it is offered by a community

pharmacist rather than in the hospital. It also is a service which the pharmacist would have to reflect

and utilises a greater level of skill, knowledge experience so on the y axis it would be nearer the

bottom. This model would also be useful for the training provider as a pre-course task could be

developed that allows pharmacists to gauge how prepared they are for the course.
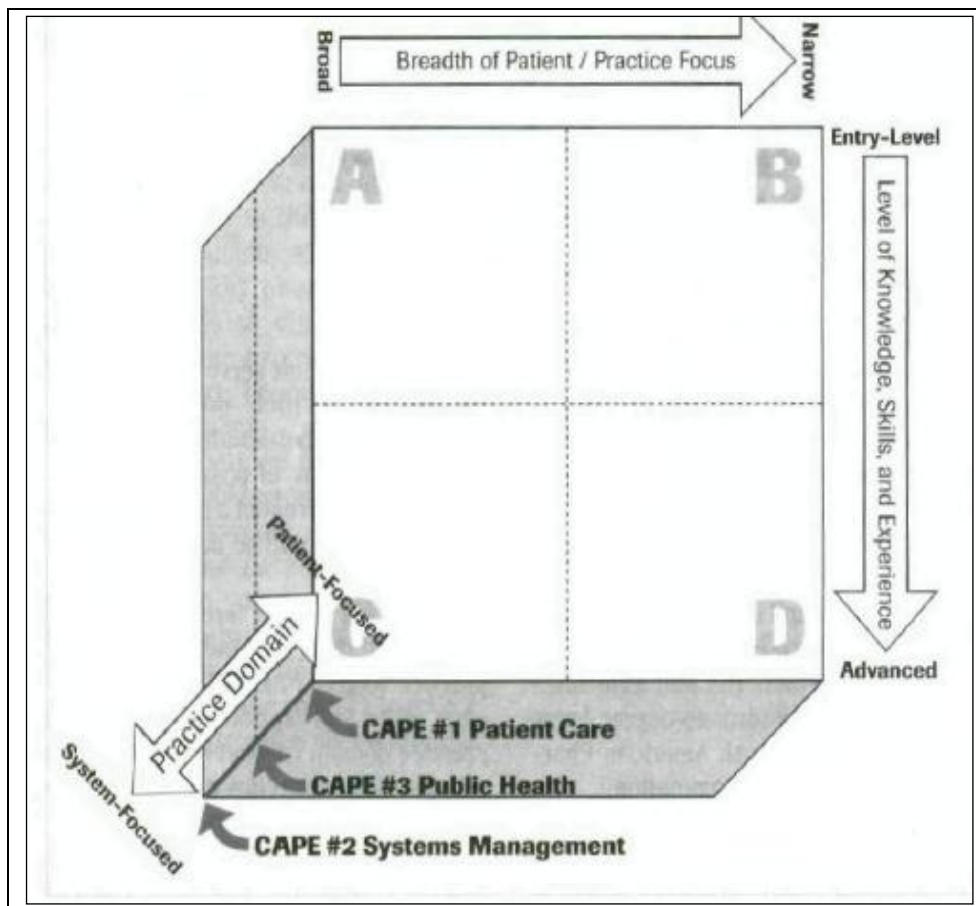
Figure 2 Framework for CPD in the United States.
This CCP three-dimensional framework depicts the scope of pharmacy practice and
professional competencies. The vertical axis is for level of knowledge, skills, and experience
(y-axis); the horizontal axis is for breadth of patient/ practice focus (v-axis) and the depth
axis is the practice domain (z-axis) of pharmacists. (Adapted from Council on Credentialing
in Pharmacy as cited in Rouse & Maddux, 2010, p. 344).

Courses for pharmacists learning alone were labeled in the article by Barr (2009) as

Uniprofessional, distinguished from Interprofessional education. This latter category is when the

different professionals learnt 'with, from, and about other professionals to improve collaboration

and the quality of care' (Table 1, p148). In the United Kingdom the Open University had created a

solid history of quality distant learning for healthcare professionals, in which there are opportunities for some of the different healthcare professionals to mix. Examples are also given of the ever encroaching e-learning in interprofessional education, notably the The Centre for Inter-Professional e-Learning (CIPel) [13] and the Canadian Institute of Interprofessional Health Science education. (p. 149)

Within the MUR training environment the most important stakeholder is the pharmacist both as an employer and as a training course participant. By making this distinction, the driving factors for both the types of e-tools and how these could fit in to on-going professional development, can potentially be found. E-learning has the potential to provide delivery of training in any of these competency areas. In the next section of this literature review, a justification for the potential for on-line learning is presented.

3.3 E-learning – What is possible?

Namara et al. (2009, p. 52), suggested traditional face to face lectures or seminar style of delivery, while still the most common teaching method for professional development for pharmacists in Australia, may not be the most convenient or cost-effective method of delivery. Blending or hybrid learning is where there is a mix of traditional and supported on-line learning in a course. In the literature search there were no studies directly related to e-training for the MUR service. A three dimensional model that can be used in a similar way for e-learning as Figure 2 was for pharmacy CDP can be found on a Wiki, meaning it was developed collaboratively. This was developed to support e-learning in New Zealand tertiary institutions.[14]

A less complex way to categorize e-learning tools was developed by Romiszowski, as cited in (Wall & Ahmed, 2008) and is shown Figure 3. Here e-learning is described as a set of tasks

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www.**cipel.ac.uk**

14

http://elg.massey.ac.nz/index.php?title=E-Learning_Guidelines

completed alone or it can represent activities completed as a group. This classification will be used as a reference for describing the types of e-tools mentioned in this literature review.

	Individual self study: computer based instruction/learning/ teaching (CBI/L/T)	Group collaborative: computer mediated communication (CMC)
Online study: synchronous communication ("real-time")	Surfing the internet, accessing websites to obtain information or to learn (knowledge or skill)	Chat rooms with(out) video audio/video conferencing
Offline study: asynchronous communication ("flexi-time")	Using stand-alone courseware/downloading material from the internet for later local study	Asynchronous communication by email, discussion lists or a Learning Management System

Figure 3 **Classifications of e-tools**
Source: **Romiszowski (2004, p.6*)*

It would be a mistake to assume on-line course delivery and traditional methods are interchangeable; putting course content on-line will not necessarily mean the participants in these courses either learn more effectively or enjoy the experience more. Factors that support successful continuing education such as, trusting the source of content, the learners' preference for interactive activities and the opportunities the learners have to apply the skills or knowledge, maybe more important than the mode of delivery. (Namara et al., 2009, p. 54)

A number of pedagogical perspectives and approaches have been used to develop e-learning and blended learning. While there is considerable analysis of how these approaches can be used to support e-learning development, the pace of development in information, communication and social networking technologies, means the pitfalls of using e-learning for delivery may create barriers to its further adoption. The importance of using the pedagogy when developing content for e-delivery is discussed next. MUR training is vocational, so adult learning theory is also introduced at this point of the review.

3.3.1 E-learning theory and practice.

For developers of training programmes it is important to provide evidence of sound theoretical links for e-learning so frameworks and development cycles can be established. Perhaps this reliance on theory is because without face-to-face contact with students, educators need to find a firm footing by applying pedagogy to the design of lessons. Comeaux & McKenna-Byington, (2003) suggested this when describing the experience of moving their programmes on-line. They claimed as '… we were being urged (and provided with monetary incentives) to develop fully online courses, it became necessary to actually reflect on our teaching practices and articulate them for others. Inadvertently, the integration of interactive technologies in our courses became a catalyst for reflective dialogues across disciplines about our teaching and learning practices' (p.354).

The type of communication or interaction used in an on-line lesson is the distinguishing factor in the classification of e-tools in Figure 3. There is interaction between the student and content. The outcome of on-line interaction between student and content may not be any different than if the content was delivered in a classroom setting. The usual process of handing out notes or letting the students write their own notes and the student downloading the notes from an on-line repository or Learning Management System (LMS) is a self-directed process. It is what is done with the notes or the interaction with the content involved. Interaction with other peers though can make it possible to engage with the ideas and concepts to produce a deeper understanding. This idea is the principle promoted by social constructivism, a concept developed by Lev Vygotsky, as cited in Sthapornnanon, Sakulbumrungsil, Theeraroungchaisri, & Watcharadamrongkun, (2009)**.** An example of this concept applied through the use of an online social media tool, can be found in the study by Marrero, Woodruff, Schuster, & Riccio, (2010)**.** Here a case study method was used to evaluate short courses for teachers, designed by the National Aerospace Association (NASA). The course content was made available for teachers from a network of colleges interested in space and science across the United States. The participating teachers which used the courses both as professional development opportunities and as a resource for their college curriculum, 'felt it was important to interact with and learn from other educators who are located across the country' (p.

93). Each participant brought their individual accumulated knowledge, set within their socio-cultural background. Through an amicable forum the study participants were able to build new knowledge through their collective contributions to discussions. Interaction was preferably, synchronistically rather than asynchronistically. This study was not healthcare related. The results were relevant to this review because, it demonstrated that a professional group dispersed geographically, in this case teachers, were able to explore and create knowledge together on-line.

The principle of social-constructivism promotes a more equal relationship between tutor and student in the sharing of knowledge. It can be difficult for students to adjust to this relationship, as found in the study by Sthapornnanon et al., (2009) of an on-line marketing pharmacy course in Thailand. Students 'found it was not easy to move from a passive learning to an active learning style' (p. 6).What was of interest in this study were the tasks in the course were arranged so they fitted the requirements of a Social Constructive Learning Environment (SCLE). This study evaluated a module of the course using both, The Constructivist Online Learning Environment Survey (COLLES) and a formal course evaluation. While there were positive results because the on-line activities achieved the goals they were designed for, the evaluation did not try to link the on-line activities to the student's performance in the course assessments. The evaluation process was also undermined by problems common in evaluating education programmes. Getting students involved in the evaluation was difficult, because participation was on a voluntary basis and as the overall programme used a blended learning approach, students had other course commitments when the evaluation was being conducted.

The study did confirm though, the importance of establishing the level of support needed for students when there were no face-to-face encounters with teaching staff. For students to participate in an e-learning activity they need to have a parcel of computer and internet skills. The more adept they are, the less likely they will need support to engage with content and other participants on the course. The level of support needed can be gauged through the concept of scaffolding and is navigated by the zone of proximal development (ZPD). It therefore becomes crucial to establish

what a student can do with and without help; the difference being the ZPD. (Sthapornnanon et al., 2009, p. 1)

No matter how prepared the students are the course must have relevant learning outcomes. Bandy (2008) issued the warning that e-tools are not just about fun and games. This goes back to the design where the course organiser needs to be a part of the design, especially the communication component ' Skilled developers build courses that are carefully aligned to students' needs, allowing them to directly achieve their learning goals, making e-learning an essential part of education' (p13).

It can be assumed that collaboration is through social processes. Achieving periods of collaboration when a group constructs new knowledge through pooling individual contributions is at the fourth stage of a series of a five stage model developed by Salmon (2002).[15] This model was designed to be used for people facilitating an on-line group in an e-activity. What was interesting in reviewing this model was identifying that at each stage there was a clear need for a level of technical support. The technical support a student received would likely impact on their enjoyment of the course.

This technological component that e-learning relies on, was identified as needing considerable attention in the planning stage of a course. Caplan (2008) stated 'Developing effective instructional materials depends on a great deal of planning and collaboration, and concerted efforts from many people skilled at using the right tools. These requirements are even more crucial in online multimedia and course development, which is highly dependent on ever-changing computer technologies' (p. 192).

This declaration is supported by other studies which captured the process of developing on-line programmes but went on to describe the on-line course development process in further detail. Varga-Atkins & Cooper, (2005) captured the development process of an on-line interprofessional

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[15]   http://www.atimod.com/e-tivities/5stage.shtml

healthcare undergraduate course. The study group was made up of people expert in the content areas in the programme. These content experts worked with technical experts to find out how content could be presented and what instructional design was possible with the software and e-tools available. The study design in this research used content analysis of focus group discussions, held for the four experts who volunteered to talk about their experiences of the process of developing the courses. The results identified 23 sub-themes from the 72 comments on the tasks mentioned by these experts. The full list of comments can be found in Appendix B. These comments were grouped into overall six themes and are listed here in order of the one with the highest number of comments to that of the lowest,

- preparation
- content development
- evaluation
- general
- design and structure
- delivery (Varga-Atkins & Cooper, 2005)

This study allowed the participants to describe the development of the courses, but it did not attempt to link this to how successful the course was for students' learning.

Technological aspects should not be the concern of lecturers and educators, and as Gordon, Booth, & Bywater, (2010) stated, technology was not the barrier to learning but should be seen as a vehicle to deliver the course material. Their study followed a group of educators' experiences of working in an interprofessional healthcare undergraduate course in the United Kingdom. The educators themselves were from a diverse range of healthcare backgrounds so collaboration was important for the group in designing lessons. The logistics of managing learning for large numbers of students, from varied backgrounds and study areas were the drivers for creating as many realistic opportunities for the students to interact on-line as possible. This involved creating cases where service users could contribute. Both real users and actors were used to simulate the service users with the aim of providing authenticity. The verbatim reflective comments made by the educators participating in this study were useful. Many indicated the link to pedagogy as the key to successful

design; specifically the need to ensure the activities and content presented was designed to encourage constructive learning.

 Dualde, Faus, Santonja, & Fernandez-Llimos, (2009) study on the use of synchronistic conference video sessions for pharmacist training in Spain focused on the technological support needed. The study aimed to measure the success of video conferencing as a tool for training pharmacists to implement new pharmacy services. One hundred and ninety pharmacists, who had participated in continuing education, were randomly selected to complete a questionnaire. The questionnaire was designed to match respondents' perceptions of what had been learnt in the CPD courses and the resulting changes over time to their work practices. The work practices were related to a follow-up interview in a MUR type of service. This service represented a part of the value added service that pharmacists were being encouraged to offer. Roger's 5-step innovation–decision model was used as a theoretical basis for transfer of skills to practise. This was described by Dualde, Faus, Santonja, & Fernandez-Llimos, (2009) as

'the process by which an innovation is communicated through certain channels over time among the members of a social system. A tenet of the Rogers model is that innovation decisions are neither authoritative nor collective, but each member of the system faces his/her own innovation–decision that follows a 5-step process: Knowledge, Persuasion, Decision, Implementation, and Confirmation' (p.639).

This research strategy in this study was ambitious; trying to match by association a link between behaviour change and a video training course. It was a useful study framework for possible future research though as the methodology was explained in detail, with a strong theoretical basis in the analysis of the data collected. The success of delivery of a component of MUR training using video in an on-line format could be evaluated this way.

 Assuming the group has the prerequisite computer skills to participate in an on-line course, a group can be formed. The concept of Communities of Practice (CoP) can be applied to an on-line environment. 'Communities of Practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis', Wenger, McDermott & Snyder, quoted in Mitchell (2002) as cited

in Australian Flexible Learning Framework (2009 p. 6). There are certain prerequisites which make

CoPs more than a Learning Community. (Moule, 2006) described the three dimensions as:

'First, mutual engagement is the basis for relationships within the community. It involves regular interaction of the members who negotiate meaning of practice. Interaction may be formal or informal and requires some maintenance. Second, joint enterprise refers to the process that maintains the community. It includes negotiating the endeavours of the community. Members share a sense of responsibility as individuals and work to achieve negotiated endeavours. Third, shared repertoire includes the routines and ways of working that become part of the community practice' (p. 371).

Moule (2006) used these three dimensions as a framework and through a case study of

undergraduate healthcare students, attempted to establish if the students were able to form a CoP.

Figure 4 below shows the augmented model for CoP the researchers developed based on the

findings of the study where the above dimensions were transposed into the patterned boxes.
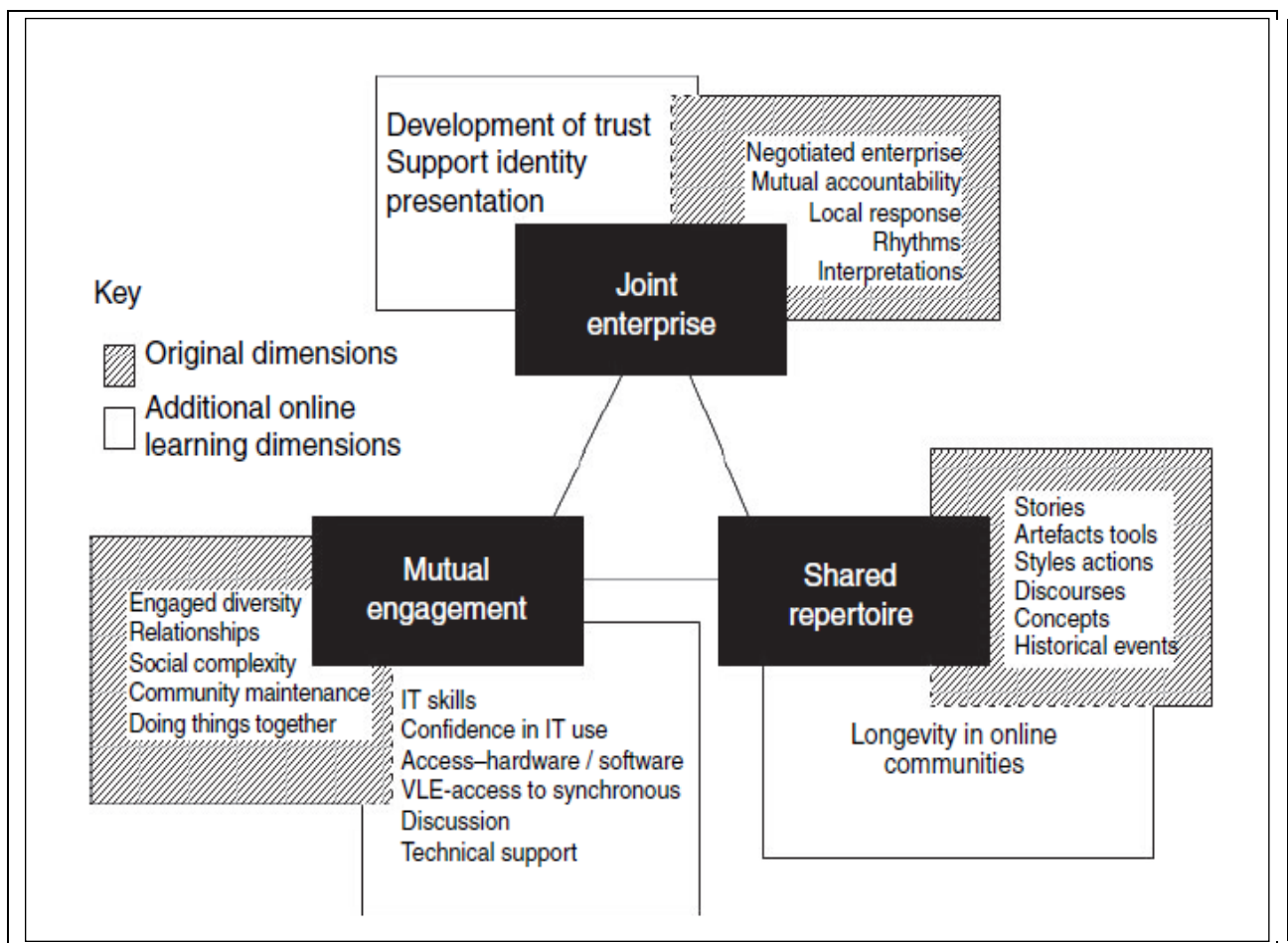
Figure 4 Augmented theoretical framework for Community of Practice.
(Moule 2006, p.377)

The study participants were from the Health Science degree course at the University of the West

of England, Bristol. The study design used was rigorous with two phases; the students self-selected

themselves into the second stage. The questionnaire used in the first phase was based on e-learning theory available at the time. While current at the time, this questionnaire would need to be adapted to be of use today. The additional elements added to Figure 4 by the researchers were based on the data collected from three sources; the online discussions and the online diaries the students were allocated to and through interviews. The mutual engagement dimension included the need for computer skills and also the measure of confidence in completing on-line tasks, which does seem a base line requirement to participate. Joint enterprise was also found to rely on trust and confidence that other participants were who they said they were. Five of the twenty three study participants were over the age of thirty. For students in older demographics, e-learning may be viewed with suspicion or be viewed with unrealistic expectations because it is seen as new and innovative.

To work together, as Joint Enterprise implies, the facilitator would have a crucial role in being both sensitive to students' preconceptions about what can be achieved in an on-line task and, sensitive to the positive aspects of role-playing if students concealed aspects of their identity. This was seen as possibly beneficial because some participants claimed they felt empowered by not revealing their cultural identity. Shared Repertoire needed longevity so the group could establish stability through ritual and shared history and the researchers acknowledged that the length of the undergraduate course was perhaps not long enough to achieve this.

Work and professional groups have the potential to have on-going contact and establish networks, perhaps even CoPs. The next section focuses on Adult and Vocational Learning.

3.3.2 E-learning and Continuing Education

Regardless of the size of the pharmacy, all registered pharmacists need to complete on-going training through CPD to maintain registration. There are varying business configurations in size of staff and different product range for community pharmacies, but all include a medication dispensary. For some this is the main revenue stream for the business.

Staff training is a management decision and as Moon, Birchall, Williams, & Vrasidas, (2005) identified 'It is also increasingly recognized that within this fast-changing workplace there is

increased pressure to identify the most constructive and cost-effective ways of using communication technology as a resource for learning (Guile, 1998) coupled with an increasing emphasis on self-directed and lifelong learning (IJelors, 1996; Diamantopoulou, 2001) as cited in Moon et al. (2005 p.370).

The study by Moon et al. (2005) reported on developments in staff training in five European countries but did not target healthcare management directly. More current and relevant to healthcare was a paper presented by Paterson (2010). The description of the e-learning facility used for staff working for the Auckland District Health Board was detailed. The use of the facility was described as innovative and its introduction was in line with the healthcare policy to cut training costs through having a shared resource across different departments and organisations. These cost savings were not just the fact staff could access the training from computers anywhere and anytime but also in the development of software to support the learning. An example of the economy of scale was given as

'Learning Central has been used to concentrate scarce high-quality technical, clinical and educational staff from two (or more) collaborating DHB's around a course development project of mutual interest. Creating communities of practice in this way leverages scarce resources for the benefit of many. The use of online forums provides support to teams struggling with the 'how to' of programme implementation' (p. 6).

Cost-savings were made by bringing training into the organisation rather than using external providers, the issue, as identified in other literature below, of high initial costs of authoring or developing the software to support the e-learning, existed. Most significant in Paterson's paper was the model of centralized learning that the ADHB's used. This centred on the *Learning Central concept* and used LMS Moodle. The problem with this model functioning at a national level was a similar one to the issue of regional funding for the MUR service; the need for some autonomy in decision-making at a regional level.

How such on-line training initiatives are set-up and developed in many countries including New Zealand is still largely left up to organisation themselves**.** Childs, Blenkinsopp, Hall, & Walton, (2005) collected data to support their recommendation that policy makers set standards and guidelines for e-learning for the National Health Service in the United Kingdom and emphasized

the role librarians should play helping healthcare professionals and students of healthcare overcome the barriers to e-learning. The systematic review was applicable to healthcare professionals generally while the interviews and questionnaires were administered to participants in the Northeast of England region. The research design offered a model of how to approach conducting a skills-check for a healthcare profession.

Adult learners in vocational context often demand courses that will move them quickly into practice, while utilizing their previous life and work experiences**.** Adult Education as a part of life-long learning relies on the learner contributing from their experiences. E-learning supports the use of this experience with the expectation that the roles of teacher and student are more of a two way process. The study by Namara et al., (2009) from Monash University in Australia collected pharmacist's preferences for types of training delivery, by telephone interviews in focus groups. The voluntary participants were grouped into three focus groups, recently registered pharmacists, rural and country based and pharmacists who were in working specialist areas. The study number was small but this grouping did seem to allow for the relationships between variables of course content and delivery method to be investigated. The results, found a preference for interactive and multidisciplinary e-learning tasks. Also found across all respondents' transcripts was the need, for Adult Learning Principles to be the foundation of training. Six of these principles were given as

- 'Actively involve learners in the education.
- Use real life problems in the learning.
- Consider and use learner's previous knowledge and experience.
- Allow learners to self-direct their learning in a supported manner.
- Allow practice learning opportunities that involve self-assessment and teacher and peer feedback.
- Allow the learner to practice self-reflection opportunities'

(Kaufman as cited in Namara, et al. (2009) p.52).

A hybrid course and its evaluation were reported on by Teeley (2007) which also acknowledged the importance of these principles. The course was for accelerated nurses and used on-line readings, discussions boards and online quizzes in conjunction with traditional classroom instruction. Here

the importance of resourcing the course sufficiently was stated; there needed to be sufficient tutors to facilitate the discussions. There was little detail in how the course was evaluated.

Wise (2009) talked about a Continuous Learning Environment based on utilising an individual's moments of learning. 'Learning moments are those snippets in time where capability and competency must simultaneously co-exist to produce sustainable outcomes' (Wise, 2009 p.1). The design of a training course for work needs to acknowledge that the learners' moments of learning could likely be during work practice and suggested that all moments of learning should be utilised by designing course programmes to allow individuals to do this. The warnings sounded by Wise over the need for training providers of vocational courses to be linked to the outcomes of participants' work performance to justify funding, are backed up by theory. This theory suggested courses should be designed with any opportunity of learning in the work routine, including informal, unstructured moments, being identified (labeled as discovery of the attributes of Continuous Learning Environment). While details of how to theoretically achieve this were given, such a course would need the participants to be aware of the different approach being taken and approve of the process as it could be perceived as unnecessary manipulation of their daily routine.

Perhaps there was a warning in this too that course participants should not be burdened by too much course management detail. Ideally pharmacists as course participants should be prepared to engage in reflective practice to set their own learning goals for CDP. They should also be given the opportunity to have input into aspects of the course programme such as rules of engagement and emphasis on specific content.

Janke (2010) in a viewpoint in the American Journal of Pharmaceutical Education believed some level of decision was inevitably left with the training provider.'While each introductory and advanced pharmacy practice experience (….) has specific objectives, preceptors are making decisions about learning activities on a minute-to-minute basis. Attend an in-service presentation or start work on a chart review? These decisions are often made with the best interest of the student in mind' (p. 1).

3.4 The e-learning that has been on offer for pharmacists globally

From the literature reviewed the evidence is clear that the drive for e-learning to play a role in pharmacist's on-going training is strong. In this last section of the literature review, studies and reviews directly concerned with healthcare programmes on-line are critiqued. There is an assumption that whatever e-tool is chosen it can be used by course participants at different geographical locations and has the potential to be used at any time if setup that way.

3.4.1 Distance modes of delivery and communication

In a systematic review by Carroll, Booth, Papaioannou, Sutton, & Wong, (2009) from the University of Sheffield in the United Kingdom, nineteen studies on the experiences of healthcare professionals in e-learning were found, after a rigorous selection process. The criteria used in selecting the papers were 'the reporting of their sampling strategies and the reporting and conduct of methods of data collection and analysis' (p. 236). Findings were grouped into five themes or constructs, as the authors termed them. These were: presentation and course design, flexibility, peer communication, support, and knowledge validation. The social nature of learning was referred to as a central theme for the review. The claim that the study was only applicable to United Kingdom healthcare workers was given no explanation as to why this might be the case. Perhaps it was due to the institutions of the National Health System. More details of findings within each theme are presented in Figure 12 in Appendix B.

Brandys, Polak, Mendyk, & Polak, (2006) referred to the 'simple HTML-based web sites helpful in specific pharmaceutical areas (Reynaud, 2001) to technically advanced multipurposeful systems' (Leemans, Verstraeten, Zwaenepoel and Laekeman, 2003; Rutter and Hunt, 2003; TOLEDO, 2005), (p. 66). Such resources have developed significantly since 2006, with some free for public access.

There is considerable advice and exchange of case based knowledge for United Kingdom pharmacists doing MURs. An example is the website for the publication *Chemist and Druggists*, which has a section especially for MUR. It states on this web page the 'MUR Zone is your one-stop

resource to get the most out of medicines use reviews, including the three target groups covered in targeted MURs, as well as being a vital reference for the Scottish chronic medicines service.'

[16]These can be accessed, down loaded for independent learning or discussed in an on-line forum. Another website offered case studies and practical advice on form filling and the processes involved in a MUR consultation. [17]

The uptake of on-line delivery, even with sophisticated e-tools, could be more dependent on the learners' needs in an actual work place. The advantages of using ICT for distance learning may be out-weighed by the resistance to using it because of preconceptions and patterns of existing behavior, including certain locations. For example Hasan (2009) in a study based in United Arab Emirates (UAE) suggested preference of learning delivery may be to do with age and the type of job pharmacists are doing. Although there was little evidence offered in research to confirm or explore this further, the proposition was that hospital based pharmacists prefer new, innovative methods for CE and community pharmacists, the print based and live seminar style.

An online survey by Maio, Belazi, Goldfarb, Phillips, & Crawford, (2003) of a randomly selected group of United States based pharmacists who were members of preselected pharmacy professional organisations, found pharmacists perceived different types of CE delivery content useful. The final study sample was of 383, and noted responses relied on user recall, but did not separate the content and delivery format in evaluating its impact. They did however, make the useful point that if technology is not used regularly to retrieve information and communicate in the workplace, then using the same technology with the internet for an on-line course may not be the first preference to access further training. (Maio et al., 2003, p.1648) The results distinguished between the different types of on-line formats used. All agreed that the programmes were useful for increasing their knowledge but preferences depended on demographics

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[16]   http://www.chemistanddruggist.co.uk/mur-zone
[17]   http://www.skillsformurs.co.uk/com/aboutTheCourse.action#

'Not surprisingly, pharmacists aged 35 years or younger, who may tend to have a better understanding of new technologies, preferred Internet based written sources, while pharmacists age 50 years and over were more interested in attending symposia, a more traditional source of information' (p.1647). Downloading and printing out materials offered the user a different type of interaction with the content than they would get by leaving the content on-line. Interaction between learners cannot be built into the presentation; both formats have rudimentary learning design as there is little difference in the potential for learning through interaction. The study did not attempt to link the lack of interaction between participants with the conclusion that the education content delivered was not transferred into clinical practice.

Two studies which described the development of pharmacist post-graduate programme were found. An e-learning project by Brandys et al. (2006) in Poland gave technical details about the development of the site with a description of the evaluation given to pharmacists who used the site for the six week period when it was free to access. Credits from completing the on-line units did count to CE for the participants. The computer site the programme was accessed from needed to 'be easy to use for the learner (and the) operating system independent and easy to administer and enlarge' (p.67). Feedback on the site was positive but the challenge for the authors was to make it financially viable, for which one prerequisite was for it to be kept up to date and relevant to current pharmacy practice.

The second study by Leikola, Tuomainen, Ovaskainen, Peura, Sevón-Vilkman, Tanskanen, & Airaksinen, (2009) a Finnish study followed a course that aimed to provide the skills for pharmacists to write a Clinical Medical Review (CMR) for patients, a more complex service than the MUR. Training was a one-and-a-half-year curriculum for practicing pharmacists that combined distance learning. The Multidisciplinary Collaboration was one of the five modules in the course and the most intensive. The length of the course was intentional so that course participants could develop over the duration of the course for this module an on-going collaborative working relationship within their local health care environment. This rings true with the need for duration for

CoP to develop, although no specific evaluations were made to ascertain this. The stages of this module were:

'(1) contacting health care partners; (2) conducting a case conference based on an anonymous medication profile from an actual working environment; (3) designing a CMR process, eg, defining the inclusion criteria for patients; (4) conducting reviews, writing case reports and having case conferences; (5) evaluating collaboration among staff and local health care providers after implementation of the CMR process and creating a plan for continued collaboration'(Leikola et al., 2009, p. 4).

Another module took the participants through the necessary form filling and tools to complete the service, such as on-line databases where information could be found. The course was developed from scratch as there was none found internationally on medication adherence which was comprehensive enough, although there was no information given about the specific training provider arrangements. The stakeholders involved in course planning were professional groups which had been involved in a push to have medication problems solved within a healthcare team including pharmacists. The study claimed this is a value added service for Finish pharmacists; it went on to claim there is little incentive to make the service financially viable. There was no information given on remuneration for the service.

While some of the outcomes of the healthcare service were similar to that of the MUR, such as relatively low numbers of the CMR being done post-training, what this study did offer was a tangible analysis of a course that used on-line discussions. Assessment involved portfolios. The discussions used Moodle[18], an open-source LMS which has a forum where the participants could discuss the cases found. The templates Moodle offered, allowed a means for course information to be presented and facilities for , assignments and Power Point presentations to be uploaded, all without any development costs for the programme providers.

The MUR training course differed in many ways to the Comprehensive Medical Review (CMR) described above by Leikola et al., (2009). For MUR training in New Zealand, the Part D the case study was prescriptive in the format and content wanted. The other learning outcomes are about the

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[18] http://moodle.org/

role of the MUR service within adherence interventions; there are no units on pharmacology. Peer support was not part of the course and has been allowed to evolve through other networks, external to the NZCP.

The MUR referrals concentrated on the chronic conditions of Asthma, Heart Disease and Diabetes which may be more to do with the DHB priories in the contract. In depth studies of adherence patterns for these patients are available. Some could offer models for programme developers in designing an e-tool. One such example was a study of a multicultural sample in New York, United States of HIV positive men by Halkitis & Palamar (2007)**.** The model they developed was based on 'a complex interplay between socioeconomic factors, drug use impairment, psychological states, and adherence' (p. 35). This is not to suggest pharmacists need to access this type of study, but the use of the method, structural equation modeling, produced a model which could feed into developing relevant and appropriate training content.

This lack of choice in readily available on-line courses or appropriate e-tools is a result of the initial resources and time needed to be put into development. Just how challenging the development of on-line resources for an in-house training programme was conveyed by Brown, Kotlyar, Conway, Seifert, & St. Peter, (2007)

'The greatest challenge we encountered was devoting the time required for development of a system that was unproven and untested. The time investment has been well worth the effort, simply because of the time saved through the efficiencies of triaging students' work and evaluators' feedback. Furthermore, the database structure has proven robust and has required little manipulation since its development. It now serves as an efficient repository of cases, further providing a return on the time investment' (p.6).

The comprehensive description of the system in this study developed for undergraduates was included in this review because of the description of the development. It is possible a provider of post-registration training would be able to adapt such a system but this would depend on costs involved in the technical changes needed.

Bury et al., (2006) explored themes in a case study of students, health educators and healthcare information professionals or learning technologist (within learning services) at the Edge Hill University in the United Kingdom, of the increasing academic nature of healthcare education, the

impact of e-learning and the role health information professionals have in those countries. E-learning was impacting on all three groups in different ways; most significantly there was the need for collaboration between academics and the health information professional to provide a clear pedagogical reason why a component of learning is delivered on-line for the student to participate and to provide the scaffolding for learning. (p. 23)

Regardless of content and the e-tools used what facility the programme provider offered the students to store and develop their work was important. McConnell, Newlon, & Dickerhofe, (2009) paper described an in-house CE programme which used video conferencing and Web-based learning management system for a large dispersed pharmacy staff. Having the video sessions recorded meant they could be stored and accessed at a later time. It is not possible to claim, even though the model was an apparent success, it could be transferred to independent community pharmacists in New Zealand. Its strength was the use of the on-line learning management system so pharmacists could self-access their learning needs and track the credits they would receive towards registration requirements.

3.4.2 Simulations

The standardized patient or simulated patient has been used in health care students' assessment as it allows testing of clinical decision-making from a range of choices and for practice within a safe environment. On-line it can cater for large groups. It is being used in undergraduate programmes as Brazeau et al., (2009) stated 'Computer-based patient case simulation, online interactive prescription simulations, multimedia case-history programming to simulate case-history taking, and the use of virtual patients have been well received by pharmacy students' (p.4) .

Thompson & Bonnel, (2008) though cautioned about the challenge of developing simulations as they can be time consuming and tutoring staff need to be in on the development process. Their study put nursing students at the University of Missouri Kansas City through a pharmacy component using a high-fidelity simulation METI-man created by Medical Educational Technologies, Inc. This was not a virtual simulation but the description of the steps in setting up the

simulation could be applied to an on-line simulation. This involved, testing the knowledge beforehand, and debriefing afterwards. 'Prior to entering the simulation room, students were given the scenario information, a medication book, and a physician's phone number. Roles were assigned and explained to the students prior to the start of the simulation' (p.520)**.** Embedding a simulation into a course had to have obvious benefits to the learners but the authors claimed the learning could be undermined also by students sharing experiences of the simulation (i.e., giving hints in how the game works). Rather than provide this as a reason not to use it as a learning tool it would be preferable to find ways that such factors are accommodated in the lesson structure so they do not affect realising learning outcomes.

More importantly was the potential to develop communication skills. This can be done through behavioral change activities. Mesquita et al., (2010) suggested that not enough of simulation is being used as a teaching method in pharmacy education. Their systematic review of literature between1980 to 2008 identified literature for use of the simulated patient and found 'evidence that simulated patient methods, when used as an educational tool, have the ability to transfer communication skills from the educational to the practice setting. Pharmacy educators should focus on simulated patient methods as an educational tool for equipping pharmacists with effective communication skills' (Mesquita et al., 2010, p. 147).

Marriott, (2007) used virtual simulations for assessment in a degree program at the Victorian College of Pharmacy, Monash University in Australia. This was accessed from distance, but was part of a blended learning programme. Each student looked after their own 'virtual patient' during three years of the programme. There were over two hundred patients in the database, each with different demographic variables. A medical history was assigned to the patient once it was chosen. These were for pharmacological lessons and intended to develop medication management and critical thinking, (Marriott, 2007, p. 344). The authors were thorough in their assessment of both the students' practice (see Appendix B, Table 13) and the evaluation. The later was both quantitative and qualitative. It was clear the simulation was not a stand-alone assessment but a part of the

programme assessment process. It was acknowledged that participation was voluntary but some information about how success in this module might impact on the undergraduates' performance in other components of the overall programme would have been useful; to gain an insight in to the simulation's usefulness would help a provider guage such a learning tool's priority in terms of budgets and resourcing. It could be said it offered the students a more enjoyable way to interact with this type of content. Peer assessment was involved with the students critiquing each others work with the intention of building up this skill, which many struggled with.

3.4.3 Online discussion and peer groups

On-line formats of pharmacy industry newsletters and forums rely on access via social networking tools such as blogs.[19] Press releases and through membership via subscription, comment and debate on issues can be made. This shows that pharmacists as a profession can be highly vocal and some are also comfortable with networking on-line.

Comeaux & McKenna-Byington, (2003) reflective commentary on working with on-line programmes in a large educational institution suggested the interaction in discussion groups moved from verbal to written which could allow for more personal and detailed dialogue. This commentary underlined that professional development for the educators is not a case of 'keeping up' with changing technologies but being supported in what options there are and by making sure there was easy access to case studies. The most useful aspect of this commentary was the descriptions of the pitfalls and advantages of how on-line discussions in two courses were set-up. The study by Curran, et al. (2005) at Memorial University of Newfoundland, Canada offered more relevant detail to this review as it examined the roles of facilitators and physicians in online asynchronous discussions. The participation in on-line discussions in over twenty-five different programmes in a Continuing Medical Education (CME) environment was measured. This was measured in three different ways,

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[19]

http://www.pharmacy-today.co.nz/subscribe.aspx

including the ratio of registrars to discussion participants and the number of postings both on average for each course and for individuals in that course. Both postings made and postings accessed were measured. As claimed by the researchers the influence of instructional design of each program was not measured. There was no relationship suggested in how many postings an individual made and how many participants were in the discussion. This may have been more influenced by the individual's commitment; the courses were free. No definition of how they were defining commitment was given. Suggestions on the factors that may encourage participation were the level of online presence the facilitator achieved and the ease of access to background material for a discussion.

It is perhaps a little artificial to suggest that on-line discussions are a stand- alone e-tool. It is usually the forum to allow students to develop ideas from other activities and content in the course. This was the case for the study by Brown, Kotlar, Conway et al (2007) which looked at the successful use of simulation of a Medical chart to teach undergraduate nurses pharmacology but found ' in-class discussions do not provide an efficient mechanism for assessing students' ability to assimilate clinical information and incorporate it into the patient chart' (p. 6).

3.5 Literature Review Summary

The literature collected to outline the MUR case-study established the service within the hierarchy of medication adherence interventions possible and identified funding, communication and paperwork involved, as problems the New Zealand MUR service had in common with similar pharmacy led services overseas. Accreditation for the service was also identified as being too comprehensive but the disconnect between a regional funding model and training provision was perhaps a greater frustration for pharmacists. On-going training needed to be put into the context of a Continuing Professional Development framework so the opportunities that e-learning presented could be realized. How a service like the MUR, including the training of staff, fits in with a pharmacy's strategic plan, can indicate how the pharmacy management believes the dispensary services it offers fits within the primary health care sector.

The potential opportunities that arise from flexibility and reduced costs of e-learning can only be realised with collaboration between content experts and instructional designers. Matching a specific e-tool to appropriate learning group and content is important. The need for a learner centred approach for e-learning fits well with the reflective cycle of training in CPD. There has been limited use of e-learning tools in training for post registration pharmacists; the two identified being on-line simulations and on-line discussions.

Chapter 4 Methodology

4.1 Introduction

A single case study method was used in this project so a description of the MUR service could provide a context to the training needed and more specifically options for the use of e-learning. 'The case study is a form of qualitative research that is the intensive study of a single unit or process. Case study research is orientated to understanding the relationships between process and outcomes and is holistic in nature. (Patton, 1990 as cited in Kerr, 2002 p.52). This case study was developed in five stages. These stages were

- Gather data
- Organise a description of the service
- Provide the reader with a description of the MUR service (See section 3.2)
- Analyse data
- Answer the research question in the context of this case study description.

(Adapted from Ellinger, Watkins and Marsick 2009 p. 10)

Ethics approval was gained through University of Canterbury Human Ethics Committee (HEC) in October 2010. (see Appendix D) and allowed the start of establishing the process to collect data. Details are presented in the Figure 5 in a Flow Diagram of the Methods used. Key points to note about this diagram are:

i. A description of case study required descriptive data. Primary data or data sourced directly by the researcher was collected directly from registered pharmacists. Secondary data was collected from published literature on research already conducted on MUR related topics.

ii. The literature is described on the left hand side as being in three topics. In actual fact there was a fourth group, titled Environment, as explained in the next section 4.2. The application of the two research tools was not sequential. The literature search continued, before, during and after the questionnaire was developed and administered. This could happen because, as Ellinger, Watkins and Marsick (2009) suggested, when using the Case Study method "Both

qualitative and quantitative methods can be used simultaneously, or concurrently, for different purposes with continuous, integrated, complementary data analysis. (p. 10). Literature collected about the MUR service helped in the development of the questionnaires. The development of these is described in 4.3.2.

iii.   The end-product in the flow diagram is the Answers box on the lower left side. The results from the questionnaires and the literature provided the answers to the research questions stated in section 2.1, to answer the case-study question:

'*What factors in the New Zealand MUR service environment drive the need for e-learning in the planning of MUR training?'*

A macro view of the healthcare environment needed to be taken. This led to the development of a model of the environment for planning training. (EPT) (see section 6.5). Specific analysis of results supported the development of the model and suggested applications for users to identify where needs for e-learning may come from in the MUR healthcare environment and what content might be in these courses.

4.2 Flow Diagram of Methodology.
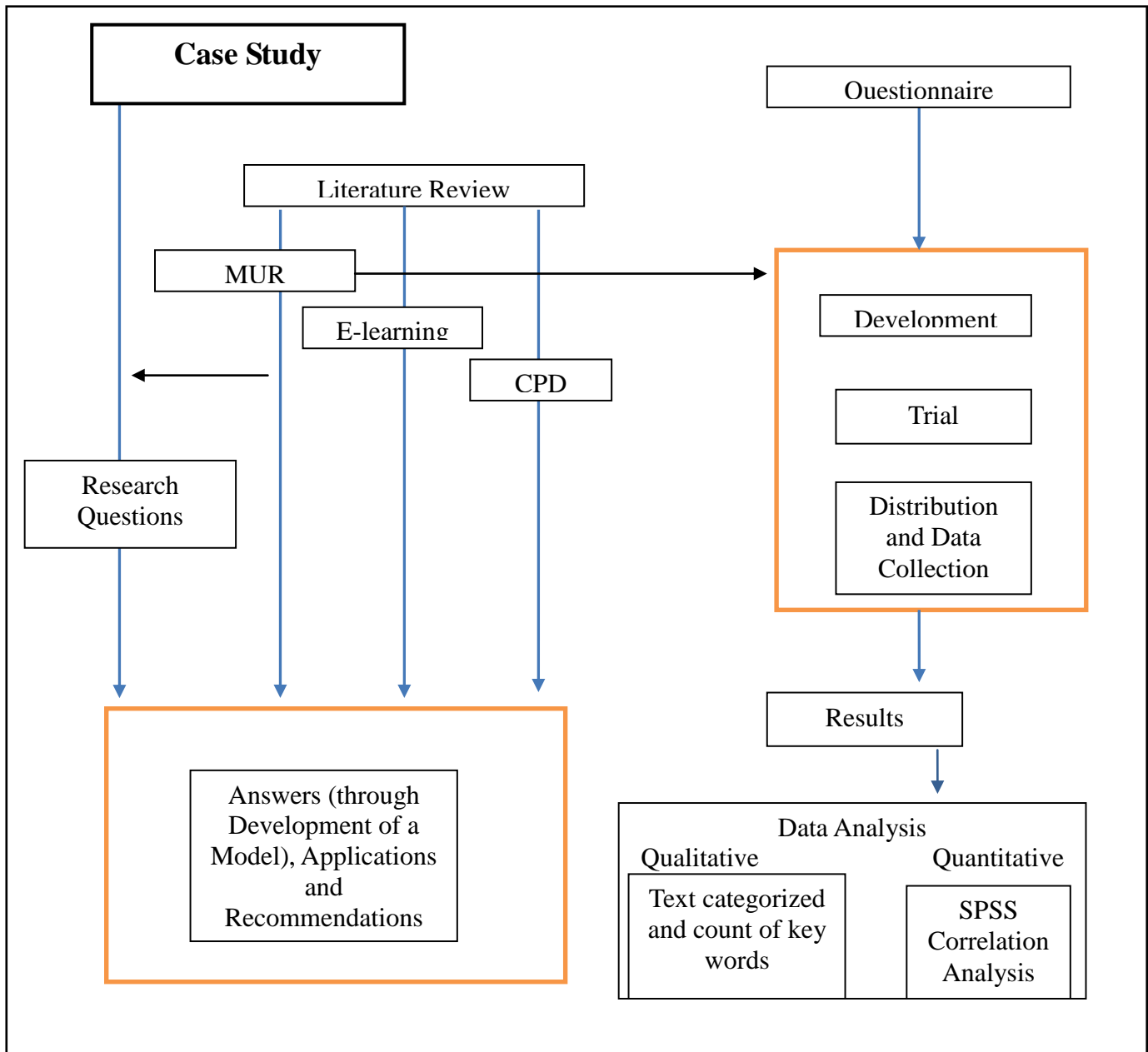
Figure 5 Flow Diagram of Methodology

The literature was collected from on-line databases during 2010 in comprehensive searches. Searches within online databases were conducted via University of Canterbury subscription or found for free via Google Scholar in the public domain. If relevant articles were found via the later, access to full copies were found via the University of Canterbury licenses.

In a few instances this process worked in reverse, especially with open source and e-books if a subscription was not needed. All articles deemed relevant were searched from a laptop so a citation could be recorded in *Zotero*. This is open-sourced reference management software, used to manage bibliographic sources. [20]If a full pdf version was not available online, a request to interloan a copy was made to the University of Canterbury library. There was a concerted intention to keep as much of the literature as possible in electronic form. The parameters of the literature searches are outlined in Table 3, including the key words used search strings. Follow-on searches were also used where an article was found as a referenced item in a retrieved article, and then searched for on the multiple databases. While most of the literature was collected during 2010, due to the Canterbury earthquakes at the end of 2010 and the beginning 2011, a significant number (over 30 journal articles) needed to be retrieved again and loaded on to a laptop by both accessing the University network remotely and through using the Databases again, but this time with direct citations used as the search tool.

- [20] www.**zotero**.org

Table 3 Inclusion/exclusion criteria and search strings

Category	General	Medication Use Review and Medication Adherence (16/01/2010)*[21]	Continuing Professional Development (CPD) (06/04/2010)	Environment of Pharmacy Professional (27/05/2010)	E-learning (05/01/2011)
Inclusion	All studies/reviews were in English After 2004 Peer reviewed, discussion documents Full access	Both NZ and international reviews	Talked about reflective process	Summarised current events Gave implications to service	Described process of setting up e-learning course/program Evaluation/assessment Of e-tools
Exclusion	Pre-2004 Not publically available No license	RTC comparing pharmacy adherence interventions	Not deemed relevant to NZ		Non healthcare unless full on-line program with explicit pedagogy description.
Search Keys		Adherence Pharm* Medication	Pharmacy post grad* educat*	Pharm* and Business	e-learning* pharm* e-learning MUR e-tools on-line discuss* e-learn* sim* *eval*

During the process of retrieving the literature for the Case Study description, training and e-learning topics, the results began to cluster into four

categories. The need to make these definite groupings became apparent as each topic had distinguishing lexicon, themes and issues. The retrieved

literature was saved into four separate electronic folders. These were titled:

- Adherence and MUR
- Continuing Professional Development
- Environment for pharmacy service
- E-learning

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[21]   * date the file was created

The literature searches focused on each of these areas. The guiding goals of the case study provided scope to the inquiry for each topic group. For example the literature about adherence and MUR needed to be collected from several countries so commonalities and differences with service components and problems experienced in the New Zealand MUR service could be identified.

Synthesis within the literature for each topic was needed before linkages between the topics could be discovered. Some articles did not neatly fit into a group. Once the case study description was built up the contribution of each literature article towards answering the other research questions became clearer. Literature was discarded as it became clear how relevant it was to the needs of the project. The need to find specific e-learning tools for pharmacists while vital at the beginning, did not remain the focus as it became clear there was not a lot of published literature on this.

4.3 Survey

The input wanted from pharmacists themselves were comments and opinions and baseline statistics for demographics and pharmacy dispensary activity. This primary data meant findings from secondary data could be firmly anchored in the New Zealand context.

4.3.1 Survey Research Sample

The population for data collection was registered pharmacists working in community pharmacies in New Zealand. The use of an on-line questionnaire meant that there was the potential for all of the sample population with access to the internet via a computer to complete the questionnaire. A level of interest and motivation was needed from respondents to self-complete the questionnaire with some questions requiring text responses.

Two groups were of interest;

- pharmacists in charge of dispensary
- pharmacists who had completed the MUR training course

While this could have been the same person it was decided to treat the two groups as separate. A pharmacist in charge of dispensary is not necessarily the owner/ manager of the pharmacy or group

of pharmacies. They would however be involved in decisions of what services were to be provided from the dispensary. Identifying the factors that influenced these decisions could also help predict how the MUR service and how training might develop in the future. An example of such a factor is, the importance placed by that pharmacist on value added services to customers run from that dispensary. Data was also needed for potential analysis of the knock-on effect of that decision of whether to offer the service or not. If the decision not to offer the MUR service from a pharmacy was made, the questionnaire needed to collect quantitative and qualitative data on the reasons why. Choosing not to offer it may also impact such issues as the professional development aspirations of pharmacists employed at that site.

For the MUR course questionnaire (CQ) the target group of pharmacists, who had completed the MUR course, were not invited directly to participate but via invitations to local pharmacy networks and via faxed invitations to pharmacy dispensaries.

As at October 2010, 746 pharmacists had completed the course but not all had gained accreditation. The figure of 239 for the number accredited was obtained verbally from Pharmacy College in July 2010 so the population for this questionnaire could not be larger than these figures. Invitations were not sent to networks in all DHBs, but the invitation could have been forwarded from those who were invited. There was no question in the survey that tracked where the responder had received the invitation from.

4.3.2 Development of Questionnaires Design

A printed copy of the two on-line questionnaires can be found in Appendix C. These were available on-line questionnaire utilising Qualtrics version 1.82 software[22]. This is a facility held on University of Canterbury's IT server and had been used by between ten to fifteen people at the University up to the year 2010. The researcher had access via the IT support person's log-on for editing the

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[22] http://acadcomp.asp.radford.edu/Qualtrics/

questionnaires and for data retrieval. The IT support person contributed to the project. Nathan Wain transferred the draft version of the questionnaire to Qualtrics and he set up the initial reports.

The use of an online questionnaire to conduct the survey allowed for a national wide sample to be taken. It became financially feasible to send out invitations to as much of the study population as possible. As well as the advantages of cost and coverage, the researcher could access the results on the University network from anywhere via a computer with an internet connection.

There were no specific pharmacy industry questionnaires to provide a template for this survey. For this reason a questionnaire was mocked up on Survey Monkey software[23] before permission to use Qualtrics had been granted. Draft questions were developed based on earlier studies (See Lee et al., 2009 and The ADMiRE Report 2009) and tested for content validity by two registered pharmacists who both had dispensary and pharmacy managerial experience. Considerable changes were made to the wording and the decision to use two questionnaires was made after this consultation. This was because the complexity of issues in the service provision, financial viability and training, needed to be simplified if the questionnaire was to be presented in an accessible form, with a logical progression.

The first questionnaire was for the business side of the MUR (DSQ) and the second for the MUR training and course (CQ). The first questionnaire was titled the Dispensary Service Questionnaire (DSQ) and the second was title the Course Questionnaire (CQ). There was a further complexity within each questionnaire.

The DSQ needed to capture data from both dispensaries which offered the service and those that did not. The logic of the question order needed to collect common data from both groups such as quantitative data on the dispensary activity. It then needed to be split to collect separate data on the experience of running the service from those that did not. For the later group data about the barriers

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[23] http://www.surveymonkey.com/

to not being able to offer the service was needed. Questions about the support for CPD were common but were included in each separate section.

The CQ had to accommodate three groups of pharmacists: Those who had done the course, those who had been accredited and those who had been accredited and were actually doing MURs. One question established if they had received accreditation. Another asked how many MURs for these accredited pharmacists had completed.

As well as ensuring familiar language was being used this also kept the questionnaire short and straightforward so as to avoid responder burden. The questions that required the respondents to express strength of opinion were captured on Likert scales. In total six questions with Likert Scale formats were used as they provided an efficient way to ask multiple related questions in one group. Most questions provided a free text space after, to add further explanation.

Approval was received to use Qualtrics under the University of Canterbury's license in October 2010. See Appendix C for final versions of the questionnaires.

4.3.3 Questionnaire Administration and Distribution

Information was needed to answer the questions set for the case study, but also needed was information on the best pathway to distribute an invitation to complete the questionnaires to potential study participants. Contact from April 2010 to December 2010 was made with healthcare professionals, both regional and national pharmacy organisations by telephone and email. A key result from this process was purchasing the June 2010 directory for all pharmacists from the National Pharmacy Guild as a population for the survey.

Sending out the invitations involved faxing to pharmacies national wide. The NZPG national directory became a data set which included the Pharmacy name, address and telephone and FAX number but no email address. The directory was grouped by DHB region. A dataset of a fax numbers with a dummy variable was cut and pasted in to an excel spread sheet. A subtotal for each DHB was made. The fax numbers were then copied into Microsoft's outlook express fax software. A test fax was sent successfully to the supervisor and to the health science office.

The link to the questionnaire on the University server was trialed several times by three people to confirm the process had been explained in the invitation well and that the trial responses sent through appeared in the Qualtrics, in the data form expected.

The computer fax software was set on automatic dial overnight on three occasions in July 2010. The total of the invitations sent is for the number of faxes numbers which connected. Not all faxes numbers connected even after redial. This set of non-connections represents charge of pharmacy dispensaries which were not contacted and therefore not included in the total who were invited.

Copies of questionnaires

It was decided to create copies of each questionnaire so the task of faxing could be done in batches. It allowed for a level of tracking; if there was a problem with the distribution process and the invitations were not received or the data unusable then rather than repeat the process, data from a different batch could be used.

The invitation to compete the DSQ was faxed in four batches.

- Batch one with a link to copy one was faxed on 14th October 2010 to 244 pharmacies in Northland, Waitemata and Auckland.

- Batch two with a link to copy 2 was faxed on 17th October 2010 to 266 pharmacies in Counties Manukau, Waikato, Bay of Plenty, Hawkes Bay, Mid-Cental Lakes regions.

- Batch three with a link to copy 2 was faxed on 18th October 2010 to 167 in Hutt Valley, Capital Coast, Canterbury, Southern regions.

- Batch four with a link to copy 3 was faxed on 22nd October 2010 to 162 to Auckland, Waitemata (North Shore) and Capital Coast (Wellington).

The intention was to use a further copy for the smaller DHB once it was established how the funding for the service was being organised (i.e. PHO or DHB). However, the complexity of sending out to these regions with less than 20 pharmacies was deemed too time consuming to pursue. Faxing nationally was free over the researcher's home line.

<u>Course Questionnaire</u>

Connections made with people in the healthcare sector were further refined so they could be used as a link to forward a reminder for the DSQ and with an invitation to complete the Course Questionnaire. The DHB contacts were with networks which were active.

There were two copies of the Course Questionnaire. The first was sent as a pilot on 27th September 2010. This was distributed in the Mid Central DHB pharmacy network, to those who had completed the MUR course. The reply came back on 13th October 2010. No changes were made as a result of the feedback.

The Pharmacy Guild of NZ Inc (Canterbury) was approached to endorse the project which was given. Both the Service and Course questionnaires were emailed to the representative of this Guild, who forwarded this on Guild members. Three weeks later a reminder for both the MUR service and the MUR training questionnaires was faxed to the two most populated regions; Auckland DHB and Capital Coast DHB. Once it became clear, after the reminder was sent with the Course Questionnaire invitation, there was to be no further responses, initial analysis was by set up and a report in Qualitics for both questionnaires was compiled. This report could be exported into pdf or Microsoft Word. The data was exported to Statistical Package for the Social Sciences[24] (IBM SPSS ver 19) and Microsoft Excel. Paper copies of the each respondents completed questionnaire were not printed out in attempt to complete analysis in electronic versions of documents.

4.4 Validity of Research Design

There was a small risk that by not having a responder key, the person filling in the questionnaire was not the person they said they were. As there was no material reward offered to respondents the assumption was those completing it were doing so for other reasons, such as to voice an opinion. It was decided there was a very small chance that someone who completed it was not a pharmacist but again it was assumed that most people would not be interested in completing a questionnaire for the

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[24] http://spss.en.softonic.com/?ab=6

fun of it. The responses were validated by checking if the logic of the questionnaires had not been violated. For example, a check was done that no respondents who had claimed the service was offered from the dispensary, had then completed the 'no service' part of the questionnaire. For the course questionnaire a similar check was made to ensure that no pharmacists whom claimed they had not completed accreditation, then proceeded to give a number for completed MURs. It was found no respondents had done this.

A level of construct validity was maintained by defining the key terms of adherence and e-learning. This meant the responses when grouped and contacted were within the definitions. One further problem which impacted on the coding was that Qualtrics used a generated number for each item in the questionnaire; both questions and instructions were numbered. This numbering does not appear in the actual questionnaire. In the report and cross analysis they did appear, so all references to questions needed to have both numbers, especially when referring to a comment section.

The anonymity of respondents meant it was not possible to make further contact for follow-up inquiry into responses, especially useful for exploring the issues of learning preference in delivery of training courses. The value of authentic comments, while relying on Pharmacist's recall, outweighed the anonymity and non-probability of the sample.

4.5 Data Analysis

A data framework based on the questions in the two questionnaires was started before the survey data had been collected. A spreadsheet was coded in Excel by each question with the data format expected. There was a larger qualitative component to the actual results from text based comments and while coding sheets devised both in excel and later in SPSS were still useful for analysis of the numerical data, text responses were stored in MS Word tables to allow them to be sorted and searched.

Describing the data and performing a level of analysis on the data was possible in Qualtrics, although these results could then be exported to SPSS or excel for further investigation. For analysis of CQ data, raw data was exported to SPSS, cleaned and coded.

There was one further step in before this could happen though. There were copies of the questionnaire in Qualtric and as each copy had valid responses they needed to be combined before there was a complete data set. This could be achieved by exporting from Qualtrics each set of responses into Excel worksheets and then combining these. This complete data set was then uploaded into an aggregate response set and then downloaded into an Excel workbook (or SPSS) and became the Master Copy for the DSQ and CQ. It was important in this process to make certain that a complete response set was not corrupted. Careful checks were made so a response in one of the copies was the same as it was the aggregate copy.

This process also allowed for the data to be cleaned. Not all original responses were included in the aggregate copy. Some respondents did not answer any of the questions. Qualtrics records the time the user had the questionnaire open and this time became a good indicator of the quality of comments. For very short periods (less than 1 minute) and for very long periods of time (probably when the user opened the questionnaire and then left it open) the greater the chance that no answers had been given. Seven empty response sets in the DSQ questionnaire were removed at this stage and one from the CQ.

4.5.1 Descriptive Data

Data were counted and aggregated for data, including for the response sets from the survey. Frequency analysis of both numerical data and text base comments were used. Two or three question cross tabulations of data were used. An example was to show characteristics of respondents, (variables were DHB, and level of dispensary activity in DSQ and sex and gender in CQ). This was important as each respondent's set of answers was to be treated as one data set and given a unique code in the Master spreadsheet. Descriptions of the respondents could be used to identify comments. This allowed for comments made and used in triangulations of results analysis to be checked back to the complete data set of an individual respondent.

Descriptive data was presented in the following areas.

From the DSQ

- Average calculations of pharmacy by DHB region to show possible population serviced by a pharmacy. (Appendix G).
- Sorting respondents into categories of 'offering MUR service and not offering MUR service. (Table 5)
- Nominal listing of professional development support initiatives both internal and external to the pharmacy. (Table 10)
- Frequency count of MUR service component (e.g. interview space, referral process).(Appendix F)
- Perceptions of usefulness of the MUR service. (Figure 6)
- Frequency counts for barriers to having a service contract. (Figure 7)
- Proportional calculation of registered pharmacists to total dispensary staff. (Figure 8)
- Barriers to running the service effectively. (Figure 9)

From the CQ

- Cross tabulation for demographic characteristics of pharmacists who have completed the MUR course.(Table 8)
- Count and aggregate of the number of MURs done for each individual pharmacist since receiving accreditation. (Figure 10)
- Frequency count of responses to skills considered essential to performing a MUR.

A modified data framework was devised after the complete report had been generated and down

loaded into Excel. The task then became one of labeling the spreadsheet.

4.5.2 Analytical Analysis

Interpreting the results of cross-tabulations procedures described above led to identifying

possible relationships between variables which in turn allowed for the discovery of commonalities

and differences with secondary data from studies found in the literature. An example is the possible

association between size of dispensary activity and the willingness to offer a service like the MUR.

Training was one of these variables. It would be desirable to be able to analyse the relationship(s)

between these variables in a separate research project in the future.

Questions within each of the three areas of

- training,
- service provision
- financial viability

were targeted as below.

- ◦ An association between the different types of training delivery method.

- ◦ An association between skills for future training and the preferences for how these can be delivered

- ◦ The age range of pharmacists, the skills wanted and the preferred method of delivery

Triangulation was achieved as comments were not always confined to the topic of that question, perhaps as a result of how quickly the respondent completed the questionnaire. Therefore, a second level of analysis was needed to refer to comments which did not originate in response a particular the question. For example a respondent in an answer to the barriers to offering the MUR service could also talk about the problems of attending the training course. This second level of analysis brought all comments together under the titles listed above but remained deductive as the headings were based on the original question groups. This second level of analysis meant comments from the two separate questionnaires could be combined.

Chapter 5 Results and Analysis

5.1 Introduction

The results from both the literature searches and the on-line survey were collected and analyzed. Section 5.2 presents the survey results. The results were grouped into three reflecting the structure provided by the literature collected on the MUR service. These were financial viability, service provision and training and are titled as following;

- Business Environment
- MUR service
- MUR course and training

These three titles were chosen as the opportunities to use e-learning needs to be looked at from two perspectives; the e-tools that can be used to deliver content to pharmacists and the selection of on-line courses by pharmacists wanting to enrol in a course.

5.2 Survey Results

5.2.1 Survey Response Set

As at the end of February 2011 there were a total of eighty-five responses in Qualtrics for both questionnaires. Of these eight were removed in the process of combining the copies of each questionnaire because they provided little or no data. Fifty-seven of these remaining responses were from the DSQ. Two further responses were removed from the twenty-one CQ responses received because of partial data; not all respondents from the remaining CQ pool completed every question. From both questionnaires there were over 250 free text comments made.

Pharmacists in eight regions could have received the invitation to the CQ via the DHB pharmacy coordinator for that region. This was sent late November 2010. There was the possibility the invitation could have been forwarded on to pharmacists in other regions. It was unknown how many of the total 746 pharmacists who had completed the training by October 2010 were working in these eight regions.

A breakdown of the responses by invitation for the DSQ is presented in Table 4. This is subtotaled for each transmission session. Interestingly while the faxes were sent to twelve regions, as copied over from the Guild directory, responses were received from thirteen. This was from the Lake District. This could be explained by the fact an owner of the pharmacy in one region also had business interests in another or the invitation was forwarded on from a colleague in another.

Table 4 Summary of Responses Received

Invitation to complete		Received
The DSQ was faxed in batches. Each batch had a link to a different copy.	Number of Faxes sent and region sent to.	
Batch 1 to copy 1:	244 faxed on 14/10/2010 to Northland, Waitemata, Auckland DHBs.	14
Batch 2 to copy 2	266 faxed on 17/10/2010 to Counties Manukau, Waikato, Bay of Plenty, Mid-central, Hawes Bay DHBs.	31
Batch 3 to copy 2	167 faxed on 18/10/2010 to Hutt Valley, Capital Coast, Canterbury, Southern DHBs.	
Batch 4 to copy 3	162 faxed to Auckland, 22/10/2010 Waitemamta (North Shore) and Capital Coast (Wellington).	19
Total s	839 faxed	64 accessed online questionnaire of which 7 were removed because there was no data.

The return rate from faxed invitations for MUR service questionnaire was less than 0.1 %. The fifty-seven DSQ questionnaires deemed of sufficient quality to use represented pharmacists from thirteen DHBs. Table 5 on the next page gives a breakdown per DHB region for the DSQ responses and is in a North – South geographical order. The responses are also divided by those pharmacies which offered the service and those which did not; this information being taken at mid-2010 point. It must be noted that for the DHBs who did not offer the service, there could well have been an existing medication adherence programme. The DHBs with less than twenty pharmacies which did not receive a direct invitation could also have had an existing medication adherence programme. There was the possibility the invitation could have been forwarded on from pharmacists in other regions, although this did not happen in this project.

Table 5 Responses to Dispensary Service Questionnaire (DSQ) by DHB

DHB	MUR funded service?	Responses Received		Total	DHB	MUR funded service?	Responses Received		Total
		Offered the MUR service.					Offered the MUR service		
		Yes	No				Yes	No	
Northland	**Through PHO**	**2**	**0**	**2**	Tarananki	**Yes**	**None sent**		**0**
Waitemata	**Yes**	**3**	**2**	**5**	Whanganui	**No**	**None sent**		**0**
Auckland	**Piloted but no funding now**	**1**	**6**	**7**	Wairarapa	**No**	**None sent**		**0**
Counties Manukau	**Yes**	**4**	**2**	**6**	Capital Coast	**Yes**	**2**	**1**	**3**
Waikato	**Yes**	**5**	**1**	**6**	Hutt Valley	**No (Alternative Service)**	**0**	**1**	**1**
Bay of Plenty	**Yes**	**3**	**4**	**7**	Nelson/Marl.	**No**	**None sent**		**0**
Lakes	**Yes**	**1**	**0**	**1**	West Coast	**No**	**None sent**		**0**
Tarawhiti	**No**	**None sent**		**0**	Canterbury	**Yes**	**3**	**8**	**11**
Mid central	**Yes**	**1**	**0**	**1**	South Canterbury	**No**	**None sent**		0
Hawkes Bay	**Yes**	**2**	**1**	**3**	Southern District	**Yes**	**0**	**4**	4
(Sub total)		**22**	**16**	**38**			**5**	**14**	**19**
					Total		**27**	**30**	**National Total - 57**

5.3 Business Environment for offering the MUR service

The first theme to be presented is that of the pharmacy business environment. This section presents baseline data from dispensary operations, the MUR service, its usefulness and factors considered in the decision to offer the service.

5.3.1 DHB and pharmacy healthcare service environment

To put the data collected into a context it was thought useful as a first step to see the breakdown of population by DHB region and the number of community pharmacies within each of these regions. Appendix G shows this breakdown. It is interesting to note, on the assumption these base figures have not changed radically since 2011 that the average population serviced per community pharmacy falls theoretically between 4000 – 5000 people, with the exception of the West Coast. This region had the least absolute number of community pharmacies so the greatest number of customers per site. It must also be noted that prescription medications would be dispensed from hospital pharmacies which are under the control of the DHB for that region.

Whether a pharmacy owner or health economist would use this measure to decide on contract allocation or service provision is unknown. Moreover the level of business activity for a pharmacy dispensary is likely to be the result of a more complex set of factors such as location and local community demographics. Dispensary activity would vary depending on factors such a urban or rural location, whether it was near a medical centre or whether it was in an area with a specific demographic group such as older persons in retirement villages.

The following data was from the questions which aimed to put the MUR service into the context of the operation of a pharmacy as a business. As a business it was assumed these factors would play a role in a decision to bid for a contract to offer the MUR service within that DHB region.

Table 6 MUR and dispensary income and activity.

		Does the Dispensary offer the MUR service?		Totals
		Yes	No	
Question 2 Dispensary service as part of Pharmacy business.	>=75,000 prescriptions dispensed by annum	21 (78%)	8 (27%)	29 (51%)
	<75,000 prescriptions dispensed per annum	6 (22%)	22 (78%)	28 (51%)
Totals for Question 2		27 (100%)	30 (100%)	57 (100%)
Question 3 Size of activity from dispensary	>50% of income generated by dispensary activity	27(100%)	23 (77%)	50 (88%)

Table 6 shows the breakdown of the fifty-seven responses from the DSQ, by the size of

activity measured by the number of prescriptions dispensed (DSQ Question 2) and contribution

dispensary revenue made to total income of the pharmacy business (DSQ Question 3). Twenty –

eight pharmacies from the total response rate dispensed less than 75,000 prescriptions per

annum, with 6 or 22 % offering the service. It could be assumed that the greater the volume of

prescriptions dispensed, the more capacity within the organisation to provide the service,

including supervision of a larger staff. 78% of dispensaries responding which offered the service

dispensed over 75,000 prescriptions. All of the pharmacies which offered the service had income

from dispensary activity generating over 50% of the pharmacy income. Only seven dispensaries

had 50% of their income from revenue streams other than the dispensary. None of these offered

the MUR service.

Financial benefit and ability to resource the service are important. It can be assumed also the

greater the number of prescriptions issued by a pharmacy the more likely that a service like the

MUR would be considered viable. Gaining an understanding of what factors are involved in this decision, including those concerning financial viability, is a possible topic for future research.

A distinction also needs to be made between the usefulness of the MUR service to customers and the usefulness of the service as a tool for the primary healthcare sector to meet set goals. With the pharmacist the agent between these two stakeholders, question DSQ 12 provided some insight into how these potentially differing outcomes were being met.
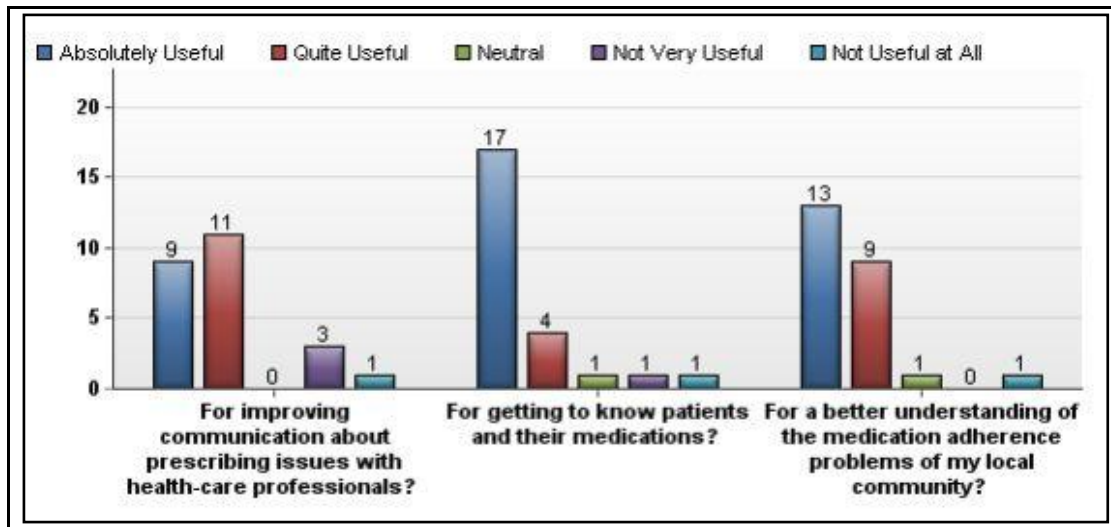
Figure 6 Opinions on the Usefulness of the MUR service
The figures on each bar indicate how many of the twenty-four respondents chose this level of usefulness.

Figure 6 shows the strength of opinion of pharmacists from dispensaries which offer the MUR service, to three suggested uses of it. Twenty-four responses were received in DSQ question 12 which was in the Likert scale format. Over eighty percent agreed or strongly agreed with each of three questions.. A second level of analysis of the comments related to usefulness produced five groups. These groups were titled:

- helping to organise how patients use medications
- application of professional knowledge and skills
- improving health outcomes for a group (for example Maori or the elderly)
- providing a community service,

and the complete opposite position where it was claimed the MUR service

- was of no use as financial return did not compensate for the time needed.

An example of a comment supporting the MUR positively was:

*'It is an important service for our largely elderly customer base. It also utilizes our professional skills, rather than just counting tablets. It is also the way of the future with technicians taking over more of the dispensing functions and pharmacists doing more counseling , problem solving and medicine management'***(from a pharmacy which dispenses over 100,000 prescriptions in the Midcentral DHB region.)**

5.3.2 Reasons for Not Offering the Service

It is important to distinguish between barriers to offering the service and problems

encountered in running the service. The latter were for those dispensaries which offered the

service, although surprisingly many respondents from those dispensaries which did not offer the

service mentioned these problems. It could be suggested that these factors were a part of the

decision making process for those pharmacies which were offered a contract to offer the service,

but refused.

To offer the service pharmacies needed to have a contract and for there to be a MUR contract

the service needed to be funded. If the specific MUR service was not funded, similar adherence

services might have been funded and called a different name. There was only one example of a

pharmacy attempting to offer the MUR service as a fee pay service. There was evidence that

some pharmacies did have contracts but because there were problems getting remuneration for

the MURs completed, they let the contract lapse. The question of whether a dispensary had a

contract at the time of completing the questionnaire, oversimplified some pharmacy's confusing

and fraught history with the MUR service funding arrangements, as one respondent described;

'the prescriber' the respondent refers to, would be the GP.

'We were the first in the country to be offered an MUR contract. We accepted it. But this was withdrawn 2 years later because we hadn't made any claims, as well as the fact that the DHB told us our closest PHO `already had enough income'. / We hadn't made any claims because the

Doctors refused to sign the claim forms. So we paid a contractor to do them and were never reimbursed. / Our DHB has continued to refuse us a contract, presumably for financial reasons. / Our DHB still tells us that Pharmacy is unable to save them money through adherence programmes as it costs the same to run a hospital every year regardless. / So the problems we identified are communication issues between the DHB and the PHOs, and Prescriber referred MURs. Pharmacy has to be allowed to initiate them to start with otherwise they will continue to be blocked by Prescribers.' **(from a pharmacy in the Capital and Coast DHB, with income contributing to more than 50% of total income)**

There were further comments outlining the details of the barriers other pharmacists had

encountered. Figure 7 below summarises the responses to the part of question nine in the DSQ

six questions in a Likert format. These responses give a good indication of the themes running

through the additional comments left.
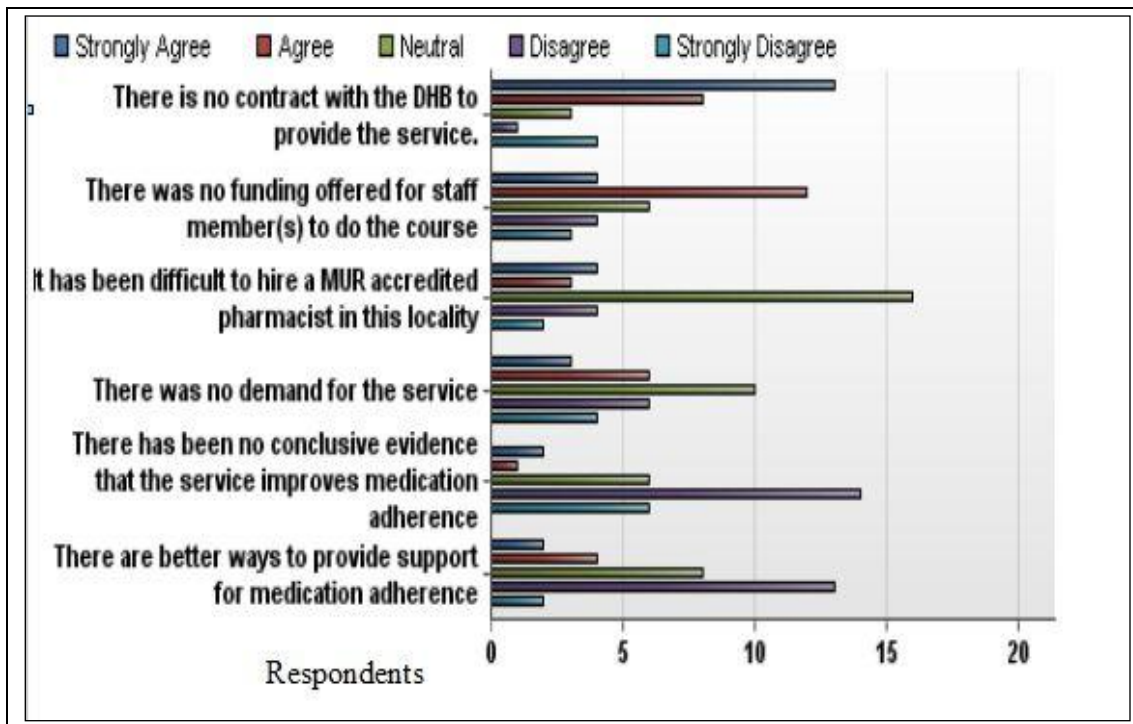
*Figure 7 Reasons for not offering the MUR service.*

The total number of responses for each question in Figure 7 was twenty-nine. It was in a

Likert scale format so the twenty-nine responses to each question were spread over the five

categories of opinion. The highest mean was for the 'there has been no conclusive evidence'

question, at (3.72, +/- 1.07) when most respondents would have tended to disagree or remain

neutral. The lowest mean was for the 'There was no contract with the DHB to provide the service' at (2.14, +/- 1.41) indicating that while most respondents had some level of agreement with this statement, some strongly disagreed, effectively spreading the distribution of responses. The actual responses were 76% either strongly agreeing or agreeing to this question. The mean which was closest to the neutral was for the 'no demand' question at 3.07, +/- 1.19.

Of these thirty pharmacists responding to this question, nine or thirty percent had been offered a contract.

It could be assumed that those pharmacists that saw little use in the service represented a group who would not want a contract whether they were in a region which funded it or not. It was likely that there was a business assessment of what resources were needed and a decision to not offer the service was made based on that assessment. There was evidence from some pharmacists in these regions where there was no funding, that they did not think the MUR service was an efficient use of pharmacy resources.

'In my experience there is very little demand for MUR's, and I believe many that are done are not really necessary' (**from a Southern DHB pharmacy which dispensed between 50 – 70 thousand scripts per annum**)

Some pharmacists had stronger opinions on these issues of the best strategy for tackling medication adherence problems. As one pharmacist commented:

'The MUR training is too involved; it is more like that needed for a clinical review. A large percentage of patients would benefit from a more practical approach to the review and this would increase adherence for a lot less effort. / The MUR is good but a lot of patients don't need a clinical review, they just need someone to sort their medicines out and to listen to their concerns' (**from a Counties Manukau DHB pharmacy which dispensed between 50 – 70 thousand scripts per annum**)

There was evidence for this in the South Canterbury DHB region, although there were no respondents from this region to either questionnaire, the DHB representative responsible for organising the MUR contract at the time of the research, forwarded letters of offer to pharmacies. These are tabled in Appendix E.

5.3.3 MUR remuneration and income contribution.

As seen in Table 6 on page 74, all of the twenty-seven dispensaries which offered the service

derived over fifty percent of total income from dispensary activity. However thirty-five percent

of these considered the income for the MUR either 'very important or quite important 'while at

thirty–eight percent, more claimed MUR income was 'barely noticeable'.

Respondents to the CQ, who performed MURs, were also asked for a whole figure received

per MUR. The sixteen responses varied widely with a range from $25 to $800. Eight or fifty

percent of these were between or equal to one hundred and two hundred dollars. The top amount

of this range was a bit suspect but very difficult to verify as the contracts with each DHB were

not public documents. Perhaps the variation can be explained by of two reasons. The first

explanation could be the way the pharmacy structured the MUR service, and the second

explanation could be how MUR remuneration fitted in to the overall finances of the individual

pharmacy. These explanations were found in the comments from the second level analysis. Two

examples are:

'.... Time spent is noted separately in our wages system so we can track time/money spent on this service against income.'(**from a pharmacy which dispenses over 100,000 prescriptions in the Hawkes Bay Region**)
'....I cannot quantify its dollar value easily as it is not itemised separately, however it is probably in the vicinity of about $10,000 per annum.'(**from a pharmacy which dispenses between 50,000 – 74,000 prescriptions in the Hawkes Bay Region**)

There also seemed to be a level of frustration related to getting paid; the GP for the patient

had to sign the completed MUR form. This might have been done in bulk so payment received

by the pharmacist could be at a date much later than the completed MURs.

5.3.4 Staffing

There was evidence in respondents' comments that staffing of the dispensary was a key factor

in both the decision to offer the service and in how successful the respondents offering the

service viewed it. Comments can be grouped under three factors;

- the availability of a MUR accredited pharmacist in the local area.
- the number of staff in the dispensary. This had both a cost and time component; for the MUR accredited pharmacist to devote one hour to one customer, their normal work in the dispensary needed to be covered by the remaining staff.
- providing time off and support in attending the MUR training.

A level of insight was also found in the answer to question ten in DSQ. Respondents were

asked how many of each of four job types there were in the dispensary. These categories were:

Registered Pharmacists, Pharmacists Assistants, Pharmacy Technicians, and Technicians in

Training.
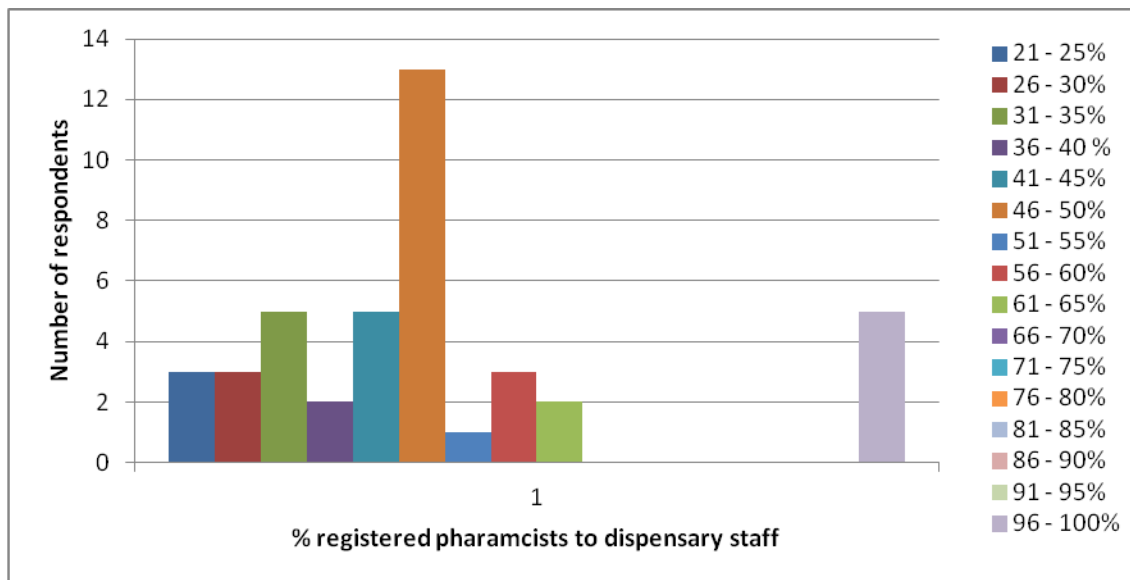
Figure 8 Registered pharmacists to total dispensary staff

Registration is not needed for all roles in the dispensary such as Pharmacy Technicians or

Technicians in Training. Some tasks can only be performed by registered pharmacists. A

pharmacists needs to be registered to train for the MUR service. Figure 8 shows the percentage

of registered pharmacists to total staff in the dispensary for the dispensaries the response set. The

absolute number of registered pharmacists may indicate the size of the operation but it does not

indicate how much flexibility there is in completing tasks that only a registered pharmacist can

perform; removing one pharmacist for an hour MUR consultation impacts on this flexibility.

Displayed as a percentage this data does give a better indication of this flexibility. For example

dispensaries in the 21-25% band might have 1: or 2:8 ratio of registered pharmacists to total

dispensary staff. Taking the registered pharmacists out of the work flow could be more difficult

than if there was a 1:1 ratio or as indicated the most common 46-50%. The 100% figure however

may not indicate flexibility at all as this could be a sole pharmacist operation. There were several

comments from pharmacists about the restrictions to dispensary services offered, as a result of

being the sole registered pharmacist at that site. This problem was solved either by using a

mobile MUR pharmacists for their customers or to employ an MUR accredited locum.

5.4 The MUR service

The second theme in these results grouped components of and attitudes to the MUR service.

These factors were considered internal to the service. They could be factors that a training

provider might consider, not just as a basis for course content in terms of skills, knowledge or

behaviour but as indicators to measure the success of training against the practice of doing an

MUR.

5.4.1 MUR service outcomes

Two questions in the surveys are of relevance here. A question asked pharmacists what

signified to them a MUR was completed and another asked what they believed were successful

outcomes for the service. Table 7 below shows a summary of these two sets of comments. This is

presented to emphasize the importance placed in the training on the philosophy behind the

service, as shown competencies for the training could be summarised as:

- MUR 1 Understand Medicines Use Review in the context of Medicines Management Services
- MUR 2 Establish and maintain effective working relationships
- MUR 3 Document the Service
- MUR 4 Maintain On-going Quality

Most respondents made the connection between completion of the MUR and payment however there were as many comments stating a successful outcome relied on non-monetary aspects. These have been grouped into four. These were: changes in behaviour, changes in a state of being, changes to medications (without reference to improvement in the patient's health) and communication.

Table 7 Factors denoting successful MUR

Total of forty-four factors identified in twenty four comments to both questions	*Freq*
Changes in behaviour (either patient's or pharmacist's)	
* Adherence improved	8
* Asks for more help	5
*GP can use information for clinical decisions	1
* Patient can make informed decisions	1
* Better team work	2
* Less trips to the hospital	3
* Pharmacy is thanked by patient and/or GP	1
Changes in a state (either the patient's or pharmacist's)	
* Confidence / empowerment	7
* Understanding / reasons / awareness	3
* From non-compliance to returning for repeats	1
* Knows what pills are for which health issue	
* Patient happy	2
* Health improved both visually and from verbal confirmation	7
Medications – when mentioned without a patient context	
* Changes made to medications	
* Symptoms reduced/ controlled	2
* Less used less wastage	1
Communication (could be between any participant of the MUR service)	
* Communication improved	
Total number of factors	44

Many of these factors could be the content of a course that a course planner would be including as curriculum. Some would be better delivered on-line, although it can be assumed that learner's preferences for training delivery would also be included in the decision to use an e-tool.

5.4.2 Service Arrangements

Of the twenty seven pharmacies which offer the service twenty-one explained the arrangements. This was a free text based question which asked respondents to describe how the MUR service was set up from their dispensary. The question did prompt answers by offering examples of on-site pharmacy consultation, home visit consultant, follow-up consultation, separate administration processes for paperwork. The answers were analysed for commonality by the researcher and grouped in four headings. These were:

- place of consultations
- origin of referral
- follow-up consultations
- separate administration processes for paperwork.

The responses were then regrouped by identifying key words and then counting the occurrences of these. This result is presented in Table 14 in Appendix F. This table is sorted by the DHB the respondent was in. It could be assumed that the regional contract would have some influence on how the structure of the service. Regional networks were formed for support and for CPD. They provided the forum to focus the direction of the MUR service. There was little evidence that the service is developing differently within regions from this table; the same problems were mentioned in comments from pharmacists in different regions. From these comments it seemed a lot depended on how integrated the pharmacy was to the primary healthcare team or more specifically, the strength of the relationship the pharmacy had with the GPs. Two examples indicate that some pharmacies from different DHBs have more in common than pharmacies within the same DHB.

'Luckily for me I have been able to work alongside domiciliary clinical pharmacy service and have very good relationship with DHB portfolio manager, PHO manager and local GPs who have all supported delivery of MUR and are willing to look at ways to work better together. Practice nurses at GP practice have also been very approachable and I have met with them regularly to discuss ways we can work together.' **(from pharmacy in the Bay of Plenty DHB)**

And *'.... Having had a referral for a MUR (either through self-referral, other health professional referral or pharmacist identification) I will go and access their clinical records from the Local GP service (due to an agreement I hold with them; they value the outcomes we try to achieve for the patient) and try to seek some recent blood chemistry or recent notes pertaining to the patients disease state and general wellbeing. I print off a medication chart of their most recent meds....'* **(from a pharmacy in the Waitemata DHB)**

The most crucial component of the service was the interview; the space used for this was either in the pharmacy or in the patient's home. Most respondents used both a space on the pharmacy premise but offered the patient the option of an interview in their home. Justifications for the home visit were given by one respondent as;

Try to do Home visits as more information shared by client in home setting. Also able to get a better idea of any social problems. **(from pharmacy in the Bay of Plenty DHB)**

The follow-up interview was mentioned by most of the respondents. All seemed to be aware that it was an important part of the MUR, as identified in the training. It can be assumed that each follow-up was most likely not a one hour interview; two respondents used a phone call to check on the patient.

Two respondents mentioned referrals. This may indicate the respondents did follow the examples given in the question, although there was a separate question specifically asking about the referrals. Most originated from the pharmacy but also from GPs and other Healthcare professional. There was a wide range of additional sources, including whanau and hospitals.

The question about the source of referrals being stipulated in the contract was not answered by most. There was a clear tension in many comments about the level of awareness of the service and how dependent the referrals to the service were on the strength of belief GPs had in the usefulness of the service.

The administration of the service was mentioned a lot. It was identified as part of the barriers to making the service function. Barriers to the service will be presented in the next section, 5.4.3. There were records not only of the patients' cases but also the reports for the DHB and forms for payment. Some allowed a specific time to complete the paper work. One had trialed an electronic version for the paperwork, software mentioned on page 19.

We trialed using Des Adams "U'Learn'n'Care" web based system which was outstanding in theory, but didn't work out so well practically. (**from a pharmacy in the Waitemata DHB**)

The flexibility in how the service could evolve was shown in some comments. These contrasted with the comments which described the frustration some pharmacists had in not having access to patients' notes. Two respondents to Question 9 DSQ had full access. One of these comments is presented below.

"....We can easily get info from our Dr's as we are in a med centre pharmacy. We just pop next door and get it. We follow up either in pharmacy or with a phone call ..." ((**from a pharmacy in the Capital and Coast DHB**)

This factor was yet another one of the barriers identified by pharmacists and is included in the next section.

5.4.3 Barriers to doing an MUR

While the problems in providing the service were the motivating factor for starting this research project, these were kept in proportion to the many other environmental factors in the healthcare service which could potentially impact on future training. Only some may potentially influence the choice of online delivery of training. Figure 9 below summarises a Likert scale format question which asked for the strength of agreement for six predetermined factors found from MUR related literature. Twenty three of the twenty seven pharmacies which offered the sevice responded to this question.
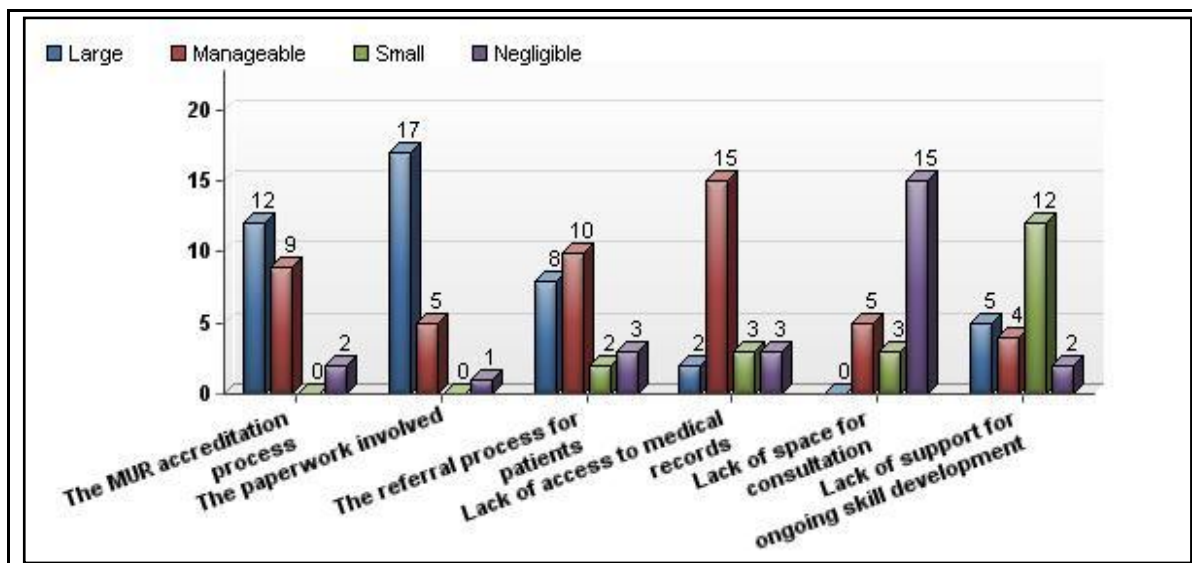
Figure 9 Strength of Agreement with problems with service

The strongest agreement was to the question about the amount of paperwork associated with

the service. The following quote sums up what many other respondents also stated.

*We have to have separate administration as dispensary software is not set up for MUR - IT needs to be! - We keep track of follow-ups & arrange reviews by using the calendar on Microsoft Office. We record the interview on paper! As this is how it has always been done - I hate paper and have reduced the amount needed to record by heaps!! and do all Dr's reports on the office computer & I can record the whole MUR process on the office computer now - But really we need it to be a separate file attached to the dispensary software - So that the dispensary info self populates the MUR etc...can be done BUT needs more people asking for it to be done. Much easier. We have every single patients MUR record stored in folders in the consulting room.'(**from a pharmacy which dispensed over 100,000 scripts per year within the Capital and Coast region**)*

It was interesting the consultation space was not considered a barrier. If it was a problem then

maybe the home visit option would have been investigated. Access to patient notes was

considered a strong or manageable barrier, by seventy-two percent, although mentioned before

for some pharmacies amicable arrangements with GP's were possible. Interestingly funding was

not given as a barrier; they would have had a contract although as has been mentioned, receiving

payment was not always a straightforward process. Some pharmacies found themselves, because

of the history of the funding arrangement in the DHB region, in difficult situations as the

following quote suggested:

*'Currently we have no funding available unless the patient pays. I haven't tried offering this service as a charge out one. Most of those who need it are pensioners. What they are prepared to pay compared to the time taken to perform them is also marginal, so not a huge incentive to move ahead with it. The incentive to me is really patient need, so we have done a few for free for those who have really needed it. (***from a Northland DHB pharmacy***)*

It cannot be claimed these barriers were impeding the number of MURs pharmacists had completed, but looking at the absolute number completed, does suggest that access to the service is not wide spread. Figure 10 shows the length of time the thirteen respondents to the CQ, had since gaining accreditation by the number of MURs they had completed since that date. Less than half have done an average of one consultation MUR per month. This analysis combined the results of CQ (Question 6 and 7) and is presented as it seems more relevant than presenting the results for each question. All of these respondents were enthusiastic about the service, so this level of activity is not due lack of belief in the benefits of the service.
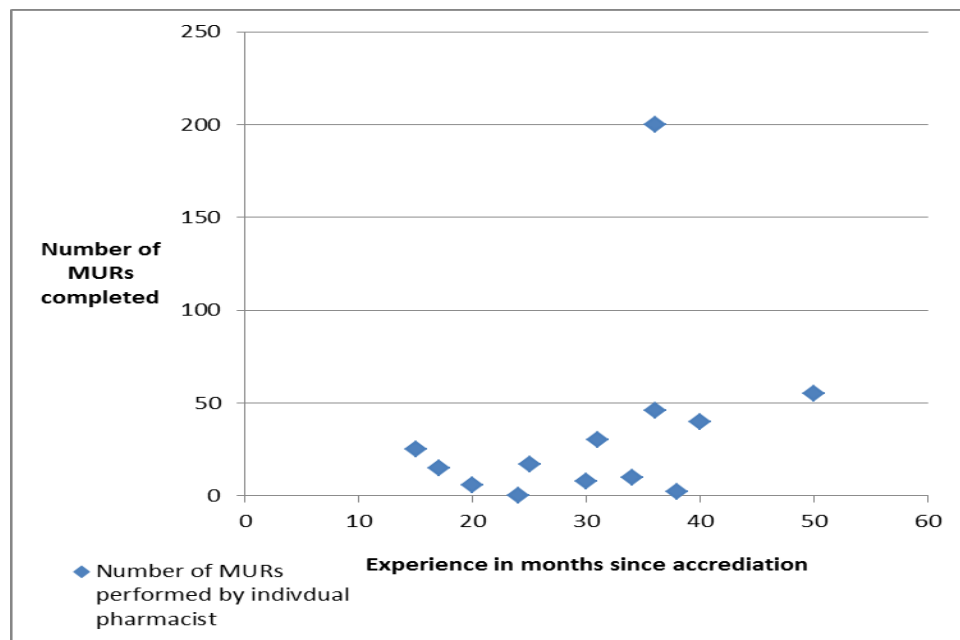
Figure 10 MUR Accredited Pharmacist's activity
Number of MURS performed by each pharmacist

The motivation to organize and grow the service was undermined by the barriers. As the following comment suggested it was not just a single factor but the accumulation of many.

'.... Poor paperwork design and the lack of interdisciplinary work have led to many completed MURs from peers in my group going nowhere. This has demotivated them so the enthusiasm for meeting up to discuss MURs has waned.' **(from a male pharmacist in Canterbury between the ages of 46-55)**

5.5 The MUR Course and Training

This section presents the results of the CQ and the training related responses from the DSQ. Questions were asked about both internal and external training support a pharmacy offered and received. These questions were asked for respondents from both dispensaries which offered the service and those that did not. The intention was to identify support for on-going training a pharmacist gets from their employer and how much of this support comes to that employer from external organisations. Presenting this data provides a context in which the respondents of the CQ participated in the training course and their preferences for methods of training delivery, including e-learning methods.

5.5.1 Who responded to the Course Questionnaire?

As shown in Table 8 there were nineteen respondents who provided useful data, although not all completed every question.

Table 8 Course Questionnaire CQ Respondents

Age Group * Gender Cross tabulation					
			Gender		Total
			Male	Female	
Age Group	26-35	Count	1	2	3
		% within Age Group	33.3%	66.7%	100.0%
	36-45	Count	0	4	4
		% within Age Group	.0%	100.0%	100.0%
	46-55	Count	4	5	9
		% within Age Group	44.4%	55.6%	100.0%
	56-65	Count	1	1	2
		% within Age Group	50.0%	50.0%	100.0%
	>= 66	Count	1	0	1
		% within Age Group	100.0%	.0%	100.0%
Total		Count	7	12	19
		% within Age Group	36.8%	63.2%	100.00%

From a total of nineteen responses a little over one third was male. The gender distribution favoured females especially in the 36-45 year age groups where there were all women. There were no respondents younger than twenty-six years old and the oldest was a male over 66.

5.5.2 Pharmacists attitudes to training

There were no specific questions that aimed to evaluate the MUR course they completed. There was an assumption that the different weekend seminar courses did not vary much in content. There must have been some variation though. One respondent claimed

*'I undertook the training but did not complete the required MUR scenarios to enable me to become accredited. I believe the training course is poorly conducted. I was away when the course took place in Waitemata DHB so did it in Counties Manukau DHB - this was incredibly frustrating as the information was different and the resources provided (including work) were different. How can you successfully complete an MUR case if you are not provided with the necessary forms to complete that case!!' (**from a male pharmacist between ages of 26-35 years old, working in the Waitemata DHB)'**

Another respondent who ran a dispensary that did not offer the service because funding had been withdrawn in the region had this to say about the training;

'.... it is too long-winded and we cannot believe the hoops we have to jump through to complete an Enhance form. We are constantly undertaking professional development throughout the year but there is no recognition for this. / The MUR audio conference was boring - I ordered the CD and listened to it on a car journey. Bad move....it was so boring I nearly fell asleep. This has to be improved if there is any serious want for pharmacists to give up their precious time' (**from a pharmacy in Northland which dispenses between 76,000 and 99,000 prescriptions, contributing more that 50% of its income**)

Instead questions about existing training were embedded in a question that used a Likert scale to gauge strength of opinion on ten factors involved in the training. The respondents checked their response in the Likert Scale object. Qualtrics assigned a '1 for Strongly Agree' to '5 for strongly Disagree'. In Table 9 below the results for those who responded are shown.

The mean shows how far from the neutral position responses were for each question. The closer to three, which was neutral, the more the respondents did not think this issue was either good or bad. The only extreme response was in question three, with fifty-six percent strongly agreeing to the statement that the accreditation was too bureaucratic; ninety-two percent were in agreement. While there was no strong disagreement in the responses to these questions; some comments left in response to other questions however suggested differently. This reinforced the need for the secondary analysis which allowed for triangulation of results.

The data from the table was subject to covariant analysis as well. The output of this analysis is in Table 15, Appendix F but any analysis of significant associations between these factors would need to be investigated further in another research project before any meaningful insight could be suggested. For example a positive statistically significant association may exist between 'Having to Adapt Skills to Accommodate DHB Requirements' and ' Didn't Target Needs of Patients in DHB contract' but exploring this association further may reveal if it warrants changing an aspect of training.

Perhaps what can be concluded from the response patterns is:

- the attitude to the training held by a respondent influenced responses to all the questions.

If a pharmacist believed the 'Accreditation process was too Bureaucratic', they were also likely to believe they 'Already had the skills in the course' and 'It did not address the Obstacles to doing MURs'.

- it highlights the practical nature of pharmacists in that they were prepared to adapt the skills of the course to the needs they had for providing the service.

Table 9 Strength of Opinion about existing training

	Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Responses	Mean
1	Meeting people on the course was useful for networking	3	3	4	3	1	14	2.71
2	I already had the skills that were covered in the course	2	7	3	2	0	14	2.36
3	The accreditation process is too bureaucratic	8	5	1	0	0	14	1.50
4	It built on existing skills I have	2	5	5	1	0	13	2.38
5	There was little focus on the needs of the type of patients targeted in the DHB contract	2	5	4	2	0	13	2.46
6	Transferring the skills to real cases has been possible	3	3	4	3	0	13	2.54
7	I have had to adapt the skills to accommodate the DHB contract requirements	1	5	4	2	1	13	2.77
8	It did not address problems that have prevented performing MURs	2	2	4	4	1	13	3.00
9	It was not necessary to hear the presenters at the course in person	3	3	3	2	2	13	2.77
10	There was little practical training on cultural competencies	2	1	4	4	2	13	3.23

A pharmacist would not have likely done the course without support from their employer.

Professional Development results are presented in the next section. While the support offered was likely to be payment of the course fee or time off to participate, it could also be

encouragement to participate in peer group training and support. There was evidence in the

results that participation in these initiatives seemed to wax and wane, perhaps depending on the

drive of the organisation which brought the peer group together for the on-going training. One

respondent described the failure of the local MUR peer group but also listed the training needs

they saw as being important, which are presented in section 5.5.4

'I liked the idea of peer support of pharmacists who were actually doing MUR's so they could discuss problems, ideas etc. However peer support groups never really got off the ground. For example in my MUR group I was the only one accredited (everyone else was still working slowly towards it) and so there was no discussion on the problems I faced setting up MUR. There needs to be a support person to liaise with all the pharmacist doing MUR in an area and the DHB to answer questions and problem solve the practical side of doing it and reporting. e.g. the DHB sent me a form and I had no idea how to fill in or what info they wanted. Also what form did I need to set up to send to Healthpac so I got paid. There was no one to go to say this is what they want and this is how they want it. Also I struggle with follow-ups calls. There is no support person to bounce ideas off- how have other MUR pharmacists resolved this problem. ' **(from a pharmacy in the Bay of Plenty DHB which dispensed over 100,000 prescriptions per annum, contributing over 50% to the gross income.)**

The issues around professional development are presented next.

5.5.3 Professional Development

Table 10 below presents two sides to on-going staff training in the dispensary; what the

employer could provide for the pharmacist to participate in training and what support the

pharmacy would like from the industry to support professional development. The number against

each type of training factor is the frequency the factor was mentioned.

These results combine responses from the DSQ from both dispensaries which have offer the

MUR service and those that did not. In actual fact there were no obvious differences between

what the two groups of pharmacists wrote in the responses to the two questions. The results

suggest there was no single solution to the staff training needs of an individual pharmacy;

perhaps as unique as the personalities and goals within each organisation. It should be noted that

support did not relate to MUR training especially but to training in general.

Table 10 Internal and external resourcing for PDC
The forty six comments were grouped by frequency and are presented in two unrelated lists in no order of
importance.

Support offered from within the business		Support wanted from external organisations	
3	None because do not have the MUR – small business and/or rural	1	Coordination of local training with specialists
1	Audio conferences	1	Database of accredited pharmacists
1	Access to patient notes	1	Gone overseas to get additional training
5	Funding the course	2	Relief so there is time – rural concern
2	(Related) travel costs	4	Case Study / Clinical notes
2	Accommodation	3	News letter (not on line)
1	Computer access	1	Skills update
4	Support network/peer support (most likely some level of clinical input)	1	Link to CDP so can gain credits
2	Support network from other health professionals	1	DHB organized peer support
1	Mentoring for MUR trained pharmacist	1	Packaging up relevant information
1	Support from work colleagues	5	Support and encouragement from college
1	Reading material	2	Organised mentoring by a MUR accredited pharmacist
1	NZCP course	1	Support in admin and healthpac skills
4	Time off / staff cover/ space to study	1	Source of funding
2	General – could be all or parts of		

5.5.4 Skills pharmacists wanted in future courses.

The course questionnaire asked a range of questions aimed to build up a packet of data from

which an idea of what might, during the planning process, go into a MUR course and the

preference for how such a course could be delivered. Question 9 asked respondents what they

believed to be essential skills for an MUR consultation and Question 13 asked about five areas of

practice the respondents thought important in their career development. Questions 17 and 18

asked about skills considered important for future MUR courses and their preferences in course

delivery of these.

In Question 9 respondents could identify skills they considered useful for a MUR consultation. For some respondents there was no distinction between MUR skills and what was in pharmacists' normal scope of practice. For example one respondent claimed

'MUR is very basic and effectively is an accredited way of asking a patient about their medications and helping them to get the best from the treatment they require to keep them as well as possible - something I have been doing for 20 years anyway.(from a female respondent, between forty-six and fifty-five in the CHDB.)

Their comments included cultural and Treaty of Waitangi content, interviewing skills, clarification of CPD requirements and life-long learning, communication skills, electronic sharing of notes and a range of specific pharmacological topics. Skills related specifically to MUR were peer group activities. (See Discussion for further analysis of this)

Table 11 Future training areas considered important by Pharmacists.
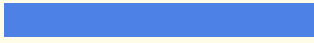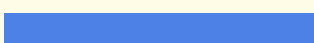
Question	Skill	Proportion to total	responses	% to total
1	Information Management		8	50%
2	Networking skills with other health care professionals		12	75%
3	Personal interaction strategies for patient dialogues		9	56%
4	Promoting the service		12	75%
5	Skills for ongoing management of adherence interventions		9	56%

Table 11 presents the results of Question 13. It was deemed useful to see how the pharmacists' on-going training aspirations fitted in their perceptions of skills for the MUR; this could indicate whether they saw themselves as wanting these skills. Table 15 in Appendix F shows the output of a Spearman's coefficient analysis that combined CQ13 and CQ17. There

were few factors that had any significance. For example participating in a course with other

healthcare professionals and improving networking skills with other healthcare professionals

both had over fifty percent of the respondents who considered these important for future training

yet there was no statistical significance found between this pattern of response. The implications

are perhaps that the content of an interprofessional course should not concentrate on networking

skills.

The variables that did show a significant association were

- if a respondent strongly agreed that promoting the service was an important topic for a
  future course, they were also likely to strongly agree that information management was
  an important topic too.

Why there is an association between these two factors warrants further investigation. There is

no pharmacology input into existing training. One respondent suggested this could be for future

content therefore providing some confirmation of the possible association.

*'Ongoing refresher courses would need to be specific such as say recognising the interaction between drugs or side effects of drugs that may be preventing a patients from following the prescribed course.' (***from a female respondent, between the ages of fifty-six to sixty-five, from the CCDHB)**

Promoting the service was also mentioned a lot. One respondent considered this a barrier to

running a successful service

'*Marketing MUR is not my strong point. It has been difficult to recruit patients. Lack of support (see above) e.g. who can I go to see how other pharmacists have recruited their patients. Due to lack of support and feedback I feel that I'm making this up (Doing MUR'S) as I go along and I have no idea if I doing well and way off track.' ***(from a pharmacist working in BPDHB, in a pharmacy which dispenses over 100,000 prescriptions per year which contributes to over fifty percent income)**

Unfortunately other comments did not provide any further insight into these possible

associations. Reducing the amount of paper work was the most common suggestion.

Question 18 on course delivery was in a Likert Scale for preferences. There were thirteen responses to the six types of delivery. These were:

- Flexibility is important because of time and cost constraints
- Face to face seminars are good for networking and meeting people
- On line discussion groups are not effective for learning
- Small group learning is most effective for me
- Self-directed learning allows me to cover course content quickly
- On line simulations of case studies would be interesting and rewarding

Respondents' opinions tended towards the agreement rather than disagreement with the statement. The mean for the first question was the lowest at 1.77, falling between the codes of 2 (agreeing) and 1 (strongly agreeing). With the lowest standard deviation at 1.07 this meant there were no strongly disagreed responses. More insight was possible by Spearman's correlation analysis. Results from more than one question were combined here. The first inquiry combined variables age (Question 1) and course delivery (Questions 18); there were no significant associations positive or negative for these two variables. A second inquiry used the factors about the existing training course in DQ Question 16 as variables. No significant association was found between any of these factors. A third inquiry used two groups of variables; the set of *future skills wanted* responses (Question 13) against *course delivery preferences* (Questions 18). (See Appendix F for tables of correlations). There were three significant associations between two variables from the different groups. Associations was found between

- A future refresher course and agreement that the delivery of training needed to be flexible. (Positive)
- A future refresher course and agreement that small group learning is effective (Negative)
- A future on-line course which was tailored to the way the MUR service was delivered by the pharmacy and face-to-face seminars were good for networking and meeting people. (Positive)
- A future on-line course which was tailoured to the way the MUR service was delivered by the pharmacy and simulation of case-studies would be rewarding. (Negative)

Surprisingly there were associations found between variables within each group.

There were significant positive correlations between:

- On-going refresher course and a course about National Audits, if such a regime was introduced. (positive).
- Course delivery needs to be flexible and face-to-face seminars were good for networking and meeting people. (Positive)
- On-line discussion groups are not effective and face-to-face seminars were good for networking and meeting people. (Positive).

Another research project could explore the validity of these associations perhaps .This

contrasts with the results of Namara et al (2009, p.55) by the fifteen Australian Community

pharmacists who participated in this study where there was no common preference for effective

delivery. Learning styles were acknowledged as a possible reason why some preferred quick

internet exercises and others preferred face-to-face forums such as weekend conferences. They

believed face-to-face instruction was useful because it supported the development and

maintaining for peer group networks. Having experts involved in the e-learning; in either face-to-

face or supporting online simulations may the key to making these tools. As one respondent

suggested

'may be an online type of support function (e.g.: chat room), for case discussion, questions on accreditation, questions in general.' **(from a pharmacist working in a pharmacy which issues between fifty thousand and seventy four thousand prescriptions per annum, in the WDHB)**

This was not just for pharmacists but for interprofessional training. Some respondents were

very hopeful about this prospect.

'the development of relationships with doctors and patients. In an ideal world this relationship building would also include personnel involved with local hospitals extramural services, community nurses, occupational therapists, physios and podiatrists' **(from a pharmacist working in CMDHB, in a pharmacy which dispenses over 100,000 prescriptions per year which contributes to over fifty percent income)**

The specific e-tool that was questioned was in relation to peer group support to talk about

MUR related issues. Of the sixteen respondents, fourteen or eighty-eight per-cent had

participated in a peer group discussion on a regular basis. The characteristics of these groups

varied in the level of formality and in the frequency of meetings. Some were for an

information session with guest speakers, and others were with other healthcare

professions, mainly GPs. Perhaps more important were responses to the Question 15, which

asked if any of these peer group networks or discussions were on-line. Fourteen responded

to this question and the split was forty-three per-cent to fifty-seven per- cent in not having

an on-line option. The four comments left for this question, also include the same theme

running through comments made about face-to-face peer support. The level of motivation

waned and with it the frequency of the meetings between the support group.

There was an MUR chat group set up but it is not used very much at present
a chat group would be good but face-to-face more enjoyable
I imagine this would be similar to the chat group and CAPA group, where any questions can be
answered by someone from the group. /
Some energy from higher up the food chain to help would be useful

Chapter 6 Discussion

6.1 Introduction

The question set for this MUR Case Study was '*What factors in the New Zealand MUR service environment drive the need for e-learning in the planning of MUR training?'* Delivery of content via e-learning remains just an option when planning this vocational training. Factors that go into the programme planners' decision- making process to use a component of e-learning in a course would be specific to the environment; in this case a MUR healthcare service environment. It was decided by the researcher that the most succinct use of the outcomes of this research project was to develop a model of the Environment for Planning Training (EPT). The intended use of the model was to aid a programme planning team's ability to identify what tools and content might be included in an e-learning course. This model is presented in Figure 11 in Section 6.5. As has been evident in the analysis of the Case Study, the MUR training course is only one part of the healthcare service. The application of the EPT model can be targeted at other stakeholders' needs; supporting the decision to use an e-learning course in CPD or identifying practical steps which can be taken by the industry to support pharmacy e-learning initiatives, are two suggestions.

The development of the Environment for Planning Training (EPT) model is described in 6.3. The model is not titled MUR specifically as it is hoped it has wider applications for training by other healthcare services. The model was developed during the research project and as such has not been validated in anyway. Validation could be through its use at any stage in the development and running of a component of the MUR training, not just in the planning phase. How might the

stakeholders use this EPT model and verify its robustness? Suggestions are made in section 6.4, with an emphasis on key factors that could support effective use of the e-learning tools. There was no evidence found that the MUR training course in New Zealand had been evaluated. Therefore after presenting the model in section 6.5, issues about evaluation are discussed. It is considered important that any evaluation of e-learning should be seen as a process to improve the course. As will be discussed, attempts should be made to avoid the outcomes of the evaluation process being lost in the evaluation of pharmacists' practice and evaluation of the healthcare service itself.

Next though is a brief summary of the results that have supported the development of the EPT model.

6.2 Results Summary

Key points from the literature were:

- The reasons for the adoption of e-learning were found to be flexibility in time and place of study and potential cost savings.

- E-learning needs planning and sound pedagogy to ensure some measure of success.

- There has been a move for distance learning courses for pharmacists' undergraduate training. For post-registration there is the opportunity to access professional material on-line and to engage in chat or on-line discussion forums but little use of on-line simulation of case studies.

- For a health care business such as a pharmacy, to offer value-added service, there are competing goals of providing a service to its customer base and achieving some level of financial return.

From the survey data, there are a number of factors which had commonalties with the factors described in the international literature about pharmacy adherence interventions services. These commonalities were in the experiences both overseas pharmacists and New Zealand pharmacists had in running the service.

- The service components had common elements, such as the administrative, sources of referral, the interview, and follow-up contact.

- There were similar problems identified. Some of these were attributed to communication skills and the role pharmacists play in the primary healthcare team.

- The regional based funding model for MUR contracts in New Zealand was identified as a problem. It impacted on service provision, the usefulnesses of the training course and pharmacists' motivation to participate in the training. There were commonalities with findings for both countries overseas which do not have a full publically funded healthcare service, such as the United States, and for those that do, such as Australia.

- While not a representative sample for all New Zealand pharmacies, data suggested that large dispensaries, measured by the number of prescriptions processed annually, influenced the decision to offer the MUR service.

- The number of responses received from the course questionnaire (CQ) was around the size of a group that might have participated in a course. The preferences for training may have been influenced by the age ranges of this group; forty-seven percent were in the age group of 46 – 55 years old, although there was no statistical significant association found.

- Frustrations of the existing training course were similar to those found in previous New Zealand studies when the service was launched.

- There was an association between some of the preferences for course training and for some of the strength of opinion for the type of content wanted for future MUR training. (see Appendix F). It was encouraging to see that respondents believed future refresher courses should be flexible. Whether this included e-tools is not clear. These associations created more questions than answers. For example, respondents who believed future refresher courses needed to be flexible also believed face-to-face courses were good for networking but did not believe they would get benefit from on-line simulations of case studies. It would be necessary to explore the strength of association in future research.

- This training was seen as part of the work relationship between employer and employee, with the most common support the pharmacy offered a pharmacist in securing MUR training was paying for the course and time off to complete the course.

- There was general agreement that the service did have a place in improving medication adherence and there existed a need for the service within the community a pharmacy operated in.

6.3 Development of the EPT model

As the case study description formed, a visual representation of the stakeholders in the MUR service became possible. It was deemed useful to develop this in to a formal model. In using a visual model a lot of the descriptive data became summarised with the intention that the reader or a stakeholder would be able to follow the application of results.

The primary stakeholders in the EPT model were:

Stakeholders	Significant connection to Stakeholder	Relationship between formalized by
Pharmacist (as employer)	Pharmacist (as employee)	Employer/ employee contract
The funder of the service DHB (from MOH)	Pharmacy	Service contract
The training provider	Pharmacist as employee	A course
The organisation responsible for professional standards and accreditation (PCNZ)	Pharmacist as employee	Maintaining registration
The organisation responsible for professional standards and accreditation (PCNZ)	Training Provider (NZCP)	Training contract.

The process of developing this model was reductionist as it was identifying the key stakeholders and relationships.

It is innately difficult to anticipate what parts of an existing service will become the key in the evolution of the service. The goals of the MUR service would remain largely the same unless there were changes at the higher policy levels as mentioned on page 18. Specific problems with the MUR service however may cease to be problems as other environmental factors change. At least one of these stakeholders is likely to be an agent of change, meaning the relationship between the stakeholders could also change. Factors seen as current barriers to offering the service and barriers to making the service more profitable and effective could be the same factors which future training is provided for.

An example was the burden of paperwork associated with the MURs (see Appendix A). This was also evident in New Zealand pharmacists' responses (see page 86) and in the overseas

literature reviewed. It was cited as a problem and also as an option for further training. Training specifically for this may not have been provided by the NZCP. It could even have been provided through peer support networks after accessing resources such as those described on page 19.

Accreditation of other training providers to the NZCP, while offering choice may increase the complexity of accreditation process. The following quote shows that some pharmacists did consider having only one provider a problem and could indicate that politics within this healthcare sector could influence the success of the roll-out of a service.

'Furthermore, I do not agree with the monopoly given to the College of Pharmacists to provide the accreditation. This is an unnecessarily complex qualification for what is essentially a task that many Pharmacists already provide day-to-day. Other providers should be encouraged into the market to oppose the "jobs-for-the-boys" mentality that pervades the Wellington based Pharmacy bodies. There are plenty of qualifications (including some available overseas e.g. the US BCPS system) that provides a more than adequate clinical training (in fact in excess of anything available in NZ) to provide MUR that should be recognised. **(From a pharmacist in a pharmacy working in ADHB, which did not offer the MUR service and which dispensed less than 100,000 prescriptions per year, contributing to over fifty percent of income.)**

The development of the model was an essential way to include these results. Data received from the questionnaires for preferences for future training and what type of course and content was organised into the three themes. These were business environment, the MUR service and the Training and the Course. The visualisation of these three components was the first version of the model, developed in May 2011.

Several versions of the model followed; the earlier versions having considerable detail and as the process became clearer, more concise labeling was possible. This process also identified the possible content of these future courses. Literature has been referred to which, if applied could lead to a better understanding of the mechanisms for choosing a specific e-learning tool. For example, it was clear that putting a course on-line to be downloaded by pharmacists with the expectation that self-directed learning would compensate for lack of pedagogical framework, was a strategy to be avoided.

6.3.1 Scope of stakeholders' participation.

The model is based on three assumptions. These are:

- That the model is not static and if different significant relationships between two or more the stakeholders are identified, such as communication between say the Pharmacy Council and the DHBs, this should be included.

- The stakeholders described are in the immediate environment. Other stakeholders could also be drivers for e-learning use and may emerge as key agents in the adoption and use of e-learning. These might include related professional groups, education providers and healthcare organisations.

- That the EPT model be used in conjunction with sources of information to actively identify environmental factors. The mode of course delivery for training is one factor which has the potential to undermine the momentum of the rollout for a healthcare service. By using the model in conjunction with such sites as *International Network Health Policy & Reform*[25], it would be possible to identify factors related to policy in national healthcare that drive the need for training. For example in New Zealand there seems to be evidence that Medication Therapy Assessment (MTA), for which a framework was released in 2011, has not impacted on the MUR service plans. A reason may be because it is not a publically funded service as the MUR is within the Medication Management Service (MMS) [26]

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[25] http://www.hpm.org/en/index.html

[26](see Pharmacy Today 06/04/2011)

6.4 Uses to validate the model

6.4.1 To support training providers

There was little evidence to suggest New Zealand is lagging behind or at the forefront of innovation in the use of e-learning for post-graduate pharmacists. An example of what is currently available in the New Zealand can be found at the University of Auckland Continuing Education which offers a specialist course on-line on Pharmacist Legislation. This course is aimed more for overseas training pharmacists.[27]

It can be assumed providers for such post-graduation training would have some awareness of the stakeholders who might have an interest in a course they provide. For example training outcomes would likely be dictated by competencies set by the PCNZ. It could be assumed refresher courses contribute to CPD but also bring busy practising pharmacists up to speed with current issues. These courses offer an opportunity for pharmacists to network and escape their work roles and daily work pressures. There was some indication this was the case with pharmacists' level of agreement to questions in DSQ number 18, page 96, although it must be acknowledged the sample is not representative of the pharmacy profession in New Zealand.

Another example, is the challenge a provider would have to reintegrate groups who have been through the training but have either done nothing with it or have had different experiences in their practice, as in the case of the MUR training. This process may include developing a generic course to cover a service component that has evolved differently in regional service arrangements. Doing such a generic course is not likely to be relevant for many course participants and most likely be a frustrating experience. It was clear that the pharmacists were not prepared to suffer discontent as their comments on page 90 showed.

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[27]https://courses.cce.auckland.ac.nz/cart/jsp/course.jsp?categoryId=10001&courseId=CE.PFDEVP10204

This need for refresher courses is not a hypothetical situation though as the continuing rollout of the MMS[28] in Canterbury shows. In the Canterbury region the service has been rebranded the Medication Management Service and funding distribution and contract allocation has been passed to the Canterbury Community Pharmacist Network. Some pharmacists who had already completed the course may have needed re-fresher courses. Also those pharmacists who had not completed the part D of the MUR training, needed to be encouraged to complete accreditation. Canterbury Community Pharmacy Group lobbied for free sessions from the NZCP. Anecdotal feedback confirmed the success of this lobbying as refresher courses were offered by the College for free. This type of gesture by the College and initiative by CCPG could be the motivator to complete the training pharmacists were looking for. These refresher courses were in the same seminar format though.

Responses on page 94 indicated that courses may have other content, not specifically that of the MUR competencies. This included courses that honed pharmacy skills in how to offer value added services. It would be unfortunate that in encouraging the business model, it also encouraged competition between pharmacists for contracts. Whether DHB contract process is competitive is unknown. What is known is that the process can be demotivating for training as the following comment shows. In this region there were contracts for the MUR available but only for some pharmacies.

*'I have completed half the training course but still have part D to complete. However there are no more contracts available with the DHB in this area so I see no point in completing the course until there is.'(**from a pharmacist in the BoP region.**)*

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[28] http://www.ccpg.org.nz/medication-management-service/ and
http://www.healthpoint.co.nz/default,75275.sm

Surveying the potential course participants did provide some clues. For example just over fifty percent of respondents to this question in CQ13 believed this was an important area for MUR training although there was no significant association found in Table 15 (page 203) between CQ13 and CQ 17, which also included focused on this subject. (See page 94 and 95).

A full industry survey of New Zealand pharmacists involved in MUR should be conducted, which may find similar results as that of Brazeau et al., (2009) where an underlying need was expressed for training content to include the skills which utilised their knowledge in patient centred care and skills to adapt and respond to changes in the healthcare system as a result of economic pressures and healthcare policy, (Brazeau et al., 2009, p. 2).

Such a survey might also clarify pharmacists' preference for type of course delivery. As mentioned on page 96 there were no strong opinions for the types of delivery methods they preferred; and there was even seemingly conflicting associations. There is a common social dimension to on-line discussion and face-to-face discussion because both allow for networking opportunities and the opportunity to escape their work routines. There are differences in the type of social experience. The implication of this is, these differences need to be understood and catered for so effective support can be put into place during the interactions.

There has been no suggestion found within the literature reviewed that a MUR consultation could be online; the emphasis has been on the face-to-face interview. Such a proposal can be considered a driver for e-learning though, as it would make a new set of skills for the pharmacist to acquire. It is important to consider these types of suggestion as there maybe reasons in the medium term future where it becomes the optimum solution. Pharmacists can communicate over the internet with other healthcare professionals effectively as suggested in a study by Poulson, Nissen, & Coombes, (2010) in Queensland, Australia. The study compared face-to-face and

online consultations between pharmacists and healthcare professionals with the same functional content over the internet; the outcome of each mode proved equally as effective in achieving clinical outcomes. Having an MUR consultation on-line that involved pharmacist, GP and patient might be the most efficient way in time and costs to arrange the initial MUR interview.

This technological drive is only one cluster of environmental factors which could lead to the use of on-line tools; if not impacting on pharmacist communication with their customers, would definitely impact on electronic billing and information management.

Harrison, Scahill, & Sheridan, (2012) in a postal survey of New Zealand pharmacists found broad agreement with the Ten Year Vision strategy document (TYV) (Pharmacy Sector Action Group, 2004) for pharmacists (see page 28). This study compared individual pharmacist's views against the views expressed in the TYV. Specifically it was found pharmacists supported changes to funding which would support more professional services and there was support for the vision for greater collaboration with GPs. There was no focus on specifics of training being more flexible to accommodate the pressures of the changes within the professional working environment rather a generalized aim of needing to create high quality and widely accessible learning opportunities. Other clusters of environmental factors could be generated from stakeholders identified in the EPT model or arise from the relationships between those stakeholders. An example is the contract with the Pharmacy Council of New Zealand for training provision; a contract that specified an on-line course would be a certain driver for the training provider to plan for delivery online. Another example taking a wider view might be if the use of e-learning is seen by an ecological conscience employer/ consumer as a way to reduce the carbon foot print of the organisation.

6.4.1.2 Simulation and Online Discussion Groups

E-learning might be used for MUR training for preparing course participants before meeting on a weekend seminar. An on-line tool could be used to embed the intended skills into work practice. Comments made in pharmacists' responses in this study suggested that they had more hands-on experience of the discussion group format than with on-line simulations. This result supports Mesquita et al., (2010) findings (see page 110) that simulation is not being used enough in pharmacy education.

The EPT model (see page122) can be used by a provider to identify scenarios of factors in the environment leading to the need for MUR training with a simulation component. This scenario would indicate the likely content of the simulation and sources of input for educationists if the simulation needed to be developed from scratch.

There needs to be a safe environment established for synchrontistic simulation sessions so expertise can be shared and any criticism taken as constructive. It could be assumed that pharmacists who have been practising for a number of years would have developed the resilience to peer assess and be more open to criticism than undergraduates who were exposed to this as part of the learning process, as noted by Marriott (2007 p.342).

Small group learning was also considered more enjoyable and effective by respondents; perhaps as there is more chance of getting to know the other participants. (see Table 9, p.91). Asynchronistic activities such as simulations have the potential to accommodate more participants. The group dynamics are still intense through the use of comments (and replies to comments) on a discussion board.

The choice of how to present the simulation would ideally be a chosen by the group. This would go part way to satisfying the need Comeaux et al., (2010) identified of providing incentives for participation as one of the stages of developing a Community of Practice. The on-

line aspect could enhance the face to face peer group meetings. If a part of a regular on-line chat group for CPD, then there is a greater need for the facilitator in the simulation to prepare the group and debrief it afterwards. Thompson & Bonnel, (2008) compared this participation with just *posting* a link to the simulation for self-directed learning on a pharmacist community website. The findings were that there needed to be multiple pathways to complete actions so the pharmacists could find a way that worked for them. Delivery of CPD by any method, including on-line other than what could be done in face-to-face meeting, would need to have a transparent set-up process and one that needed minimum input by pharmacists.

One of the themes suggested by Carroll et al., (2009) from healthcare professionals' experiences of e-learning, was the need for support during the course. (see page 45) It was suggested this support came from three sources, the provider, technicians and the tutor. The provider through another of the themes, course design and presentation, should support the learner with timely and accurate information. This could be sent by either by email or post. Technical support depends on the course participants' location. If a synchronistic on-line simulation is being used, remote access by the group of pharmacists should be tested in a prior session. A technical person should be available by phone or email to help with any problems in getting into the chat room, or whatever way the participants enter the simulation. Alternatively a schedule of times when the simulation can be accessed should be posted and a technician made available to help with any problems. Timely tutor contact via email for guidance with a clear schedule of content progression permanently on the web-site is also essential. For pharmacists perhaps there could be the additional support of the organisation which is organising the professional development. They could bring all the information together for the group with a 'frequently asked questions' type page in their usual communication with the group. The choice

of a LMS would be important. Examples presented were in Leikola et al., who used Moodle and McConnell et al. who developed an in-house LMS. The decision would be made depending on the need for course participants to store content and the syncronistic components of the course and resources available to develop their own.

The content of simulations may not focus on the pharmacological aspect of a patient's case. The responses to the question summarised in Figure 9 on page 86 were in agreement that future courses should include skills and practice, not just knowledge. It can be assumed most pharmacists are interested in their customers as patients. There is a cultural dimension to those patients which can be explored to make the MUR interview more patient-focused. Training the pharmacists, to collect the information while sitting down to talk with a person about their treatment plan, is important. A full picture of the patient's pill taking behaviour and underlying motivations and difficulties of this behaviour, is then built up. An example of what this content could include is found in the review by Chia, Schlenk, & Dunbar-Jacob, (2006) these, mostly US based studies brought together factors of country of origin, the relationship between beliefs about self-efficacy and adherence for the older persons. One recommendation was ' they should assess older adults' beliefs about their medications, in particular their self-efficacy for taking medication, beliefs about the benefits of and barriers to taking medication, beliefs about control both internally and by others, and the causes and control and/or cure of illness' (p. 200). Studies such as the Australian researchers Smith, Trevena, Nutbeam, Dixon, & McCaffery, (2009) compared patients propensity for involvement in their healthcare decisions by their education background. The results showed significant differences about the role and expectations patients had with the healthcare professional. Those with higher education expected to be treated as an equal by their GP; more so with a pharmacist perhaps. People with lower health literacy may feel

they have less options in their decisions about their health but would expect a high level of empathy and interest in how the medications impacts on their lives. (Smith et al., 2009, p.7) All patients, regardless of the level of education, placed an importance on continuity of care. Simulations with a variety of patients with different demographics could allow the pharmacist to explore different aspects of the pharmacist/ customer dynamics.

Most participants in this current MUR research agreed that on-line simulation of case studies would be useful but there were conflicting results: agreement that flexibility was important but also agreement that on-line discussions were not useful. The need for the training provider to be a key driver in setting an example of how to use on-discussions was referred to by Austin, Marini, & Desroches, (2005). 'Traditional static vehicles for communicating messages or changes to busy professionals, such as e-mails, web-based or print-based resources, etc. may be ineffective in facilitating the cognitive changes required to support CPD and the Portfolio' (p. 181). On-line discussions support could have avoided the array of factors that derailed face-to-face meetings described by one respondent in the following quote;

'*met regularly to discuss cases and topics of interest where everyone takes a turn. When stopped doing as many MUR's we slowed down then had a pharmacy competition issue and have since stopped meetings but too busy as well because a number of us now are involved in lots of governance work for a different funding model'* (**from a female pharmacist between ages of 46-55.)**

On-line discussions had the advantage of potentially reducing the amount of time allocated to the activity, including travel time; It may not have been perceived as of similar value socially though. Carroll et al., (2009, p.240) found that peer communication and content validation were important factors in healthcare professionals' experience of e-learning. This interaction needed to be motivational and while content directed, could also include more informal topics. Confidence increased with the opportunity to interact even if it was not face-to-face.

Comeaux et al., (2010) suggested that case studies could be posted as the starting point for a threaded discussion. A 'thread' is a topic or theme and is 'posted' . Subsequent comments or replies can be to the initial post or parent post or to comments already made. The advantage as concluded by the author was "the least time-consuming interaction online, and one of the most beneficial." (p.350). This is a written form of interaction which has the potential for more time to reflect on comments.

With planned deliberate instruction these tools could cover the prerequisites for CoP; shared repertoire, mutual engagement and joint enterprise as presented in Figure 4 on page 40

6.4.2 Uses for the pharmacist

There was no possibility of linking the problems associated with the MUR service with the number of MURs which had been done (see Figure 10 page 87). Interestingly the same problems had occurred in the UK version of the MUR service as mentioned by Holland et al., (2006). These concerns included the commonalities some of the MUR tasks had with other pharmacy services; significant numbers of pharmacists felt these skills had been covered in undergraduate training and in their post-graduation work-experience.

The pharmacist as stakeholder could use the EPT model in two ways. These are

- To find e-learning that supports the strategic positioning of the business
- To understand if and how e-learning can work with CPD

6.3.2.1 Strategic positioning

The responses received to the question about the usefulness of the MUR service and the barriers to taking up a MUR contract, provided clues to the factors involved in strategic decision of offering a dispensary service. As stated in section 5.3.1 all of the dispensaries which offered the MUR service derived more than fifty percent of total business income from the dispensary activity. There must be a balance between financial considerations and offering a service to a pharmacist's customers; a strategy can aim to guide activity to achieve a balance between these considerations. Investing in staff to be trained to do the course could be seen as part of this strategy. There was evidence that some pharmacists do take a strategic position in planning how a service could work for them. Three-quarters of the respondents for the CQ wanted courses about the service. The respondent who made the comment on page 104 could well be interested in an online course on promoting a service. One of the aims of such a course would be to build confidence.

As some respondents suggested they needed to access overseas providers[29] for training; they were prepared to take up alternative training if that had been an option, as it would have allowed them to fit in with the funding arrangements.

'*There is a whole additional skill set that is not covered by any pharmacy training courses that is required. We have sourced these from overseas institutes*'.

As Australian pharmacists were also asking for a similar course (UrbisJHD Group 2005) as cited in Brandt, Harrison, Sheridan, Shaw, & Jensen, (2009 p.23) perhaps a course has been developed that has enough relevance to be useful in a New Zealand context.

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[29] See for an example http://www.freece.com/freece/default.aspx

The next comment shows clearly just how important funding as an environmental factor was for its impact on MUR training. This pharmacist had attempted to cover the time lag of training so would be in a position to offer the service but no amount of planning and dialogue with other stakeholders was going to allow this during this time.

*'Auckland DHB will not fund MUR. I have attended meetings with the DHB going back several years where all the Pharmacists have requested that the DHB indicate to the sector that they intend to fund MUR. This would give Pharmacy the opportunity to begin the process of becoming accredited to provide the service. The DHB have steadfastly refused to do this. I do not require funding for staff to become accredited as I see this as a business expense. However I do need to see the opportunity to obtain a return on the training investment which currently is not there. Both ADHB and CMDHB have been very disingenuous in this whole process. CMDHB have been very vocal in complaining that Pharmacy has not "stepped up to the plate" and claimed money made available for MUR in that region and that funding has now been removed. However, they are fully aware that if asked to do MUR today it could take 6 months to become accredited and then the initial MURs are quite lengthy and arduous as providers improve their skills in providing the service. Therefore to damn Pharmacy for providing very few MURs 6-months after being invited to do so is unfair and CMDHB knows it. '(***From a pharmacist in a pharmacy working in ADHB, which did not offer the MUR service and which dispensed between 50,000 – 70,000 prescriptions per year, contributing to over fifty percent of income.)***

There is little doubt of the frustration expressed as a result of the situation described above. If the EPT model was available, a plan which could be implemented within a short time frame which could allow the pharmacy business to have some control over their readiness to offer the service when funding did become available.

This planning process may include searching for on-line courses which were based on the Continuous Learning Environment method as described by Wise (2009). If the pharmacy considered training as a business expense then being offered a course which can be individualized and embedded into workflows would seem an attractive option. The author continued in a slightly alarmist way to justify the theory. 'The time is now for training organizations to shift resources beyond the classroom and beyond e-Learning, to the environment where the learner must perform' (Wise, 2009 p.2).

Another example of a course the pharmacy as a business might consider as part of skill development for MUR training, would be a course on interview skills. Such a course may have a focus on the need for cultural awareness in interviewing, as described earlier on page 112.

6.4.2.2 Encouraging CPD participation.

As well as giving a pharmacist a broader skill base completing the MUR training contributes to satisfying the requirements for CPD. There needs to be the buy-in-factor from the target healthcare group as Narmara et al., (2009) suggested 'Pharmacists seem reluctant to invest time and resources in CE that has limited practice applicability or nonexistent commercial viability'(p.56).

Part D of the MUR training (See Appendix A p. 155) required an actual MUR. This and RPL were similar assessment tools as described by Swallow et al. (2006). Just like with the need for facilitating simulations and discussions, support through mentoring is needed for both the MUR process and CDP reflective process. The quality of mentoring was just as important as providing it; 'an effective mentor will support the professional as: a teacher and assessor, an advocate, a friend and a facilitator' Neary (2000), as cited in Swallow et al., (2006 p. 87). Mentoring was mentioned once in the responses to questions to both internal and external CPD, in Table 10 on page 93. This question asked what support was provided but did not attempt to find any link to between the responsents' motivation for for participation in CPD. Identifying any links would be useful future research.

Advocacy organisations and professional networks can support the pharmacy network by working towards a framework for e-learning. Childs et al., (2005) offered a research design which could be applied to the pharmacy industry in New Zealand. Which organisation would fund it and how this type of initiative would impact on the EPT are useful research questions.

Other stakeholders can introduce factors in the environment which might impact on the EPT and drive the need for flexible training; the impact might not always be of a negative nature in the sense of having to respond to it after the fact. It is the professionals working closely in the EPT environment who will intuitively realise if a factor will create a training need that is likely to attract funding.

In DHBs where the MUR service is offered, changes such as combining all MUR contracts into one regional contract are unlikely to impact on initial training needs. This was the case in the BoP DHB [30] although the impact on-going training needs is unknown. Restructuring of the DHB may move the responsibility of funding the service to a new division, such as for South Canterbury where the contract responsibility rests with Primary and Community services now and not the external PHO; as yet there is still no interest by the pharmacists in the South Canterbury region to offer the service (see page 86). There would be little motivation for pharmacists to want to train for the service in such regions.

It is suggested that this continued delay in some regions means the experience and focus of the MUR service from those pharmacists providing the service is not covered in the current MUR training. It cannot be assumed that the existing course from a provider can facilitate the necessary networking to share this expertise or make it relevant. Just whether the NZCP is prepared to provide free refresher courses to get pharmacists through the accreditation in other regions as it did for pharmacists in Canterbury is unknown. Perhaps more importantly, and in referring to the EPT model, is how prepared the stakeholders are in agreeing to a mix of formal training and peer group training, possibly online, that matches the requirements for each region.

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[30] http://www.bopdhb.govt.nz/board_committee/CPHAC/2010/Oct/CPHAC-DSACAgenda%28open%2927.10.10.pdf

6.4.3 Other Stakeholders and Interprofessional Training

The initial MUR course is just one part of the on-going training needed. There was evidence in responses that other stakeholders can and do play a part in facilitating the peer groups and the CPD networks among pharmacists. The complexity of interprofessional responsibility for medication prescribing, patient care and agreements on funding pathways are environmental factors which should not impede setting up a repository for case studies for continuing education purposes. There was ample evidence both in the literature and results of how the relationship between pharmacists and GPs impacted on the success of the service. The contrast between the two Capital Coast pharmacies in terms of the relationship with the GP indicated the impact such an environmental factor is likely to have on the success of the service. The pharmacist's experience, whose response is on page 85, of a close working relationship with the GP, contrasted with the experience of the other pharmacy within the same region which claimed

'We hadn't made any claims because the Doctors refused to sign the claim forms' service.'

It was clear also that the referral process was an issue which has yet to be resolved. This issue related to the clinical status of the pharmacist. The environmental driver of the move by pharmacists to take a greater role within the primary healthcare team could be part of an on-line training course. A Canadian study by Kolodziejak, Remillard, & Neubauer, (2010) provided a template to how a clinical pharmacist could be integrated in to a primary healthcare team. Basically the team used action research process to ask what, where and how the pharmacist will work in with the care of the patients under a constant clinical review. These explored attitudes among the primary health care team members to the scope of the role a pharmacist could have. The action research template developed by the pharmacists would be of use in interprofessional training. The results could also feed into a simulation of a primary healthcare team with participants reflecting on the attitudes that emerged from the group.

Participant buy-in would impact on the type of training possible and the process of recruiting the group for a course. Gordon et al., (2010) emphasized the importance of using constructive principles in on-line learning. Building up knowledge between individuals with different perspectives into new 'interprofessional knowledge was a product of active learning and led to skill and knowledge acquisition around collaboration' (p. 541).

The driver of integration of technology in e-health and communication platforms could lead to on-line courses which focus interprofessional teams on collaborative inquiry and continuous quality improvement. As Barr (2009) stated this type of interprofessional training course needed the interaction to be made explicit not implicit in the learning design. 'Colleagues, especially from other professions, may introduce new perspectives, challenge cherished assumptions, and suggest alternative approaches pregnant with opportunities for co-working.'(Barr 2009 p. 148). Activities needed the group to work as a team and to be based on learning from practice rather than from theory. Likewise, chat groups may be useful for group building and unintentional knowledge building, but it is more likely that busy professionals would only participate in these if the value of that participation was made explicit. Professional development credits could be offered as rewards.

Funding agencies such as the DHB and professional bodies perhaps are in the best position to initiate on-line opportunities for interprofessional collaboration. This is especially so as the time delays in getting the service up and running can be the result of such factors as the negotiating of service contracts. (Lee et al. p.32). An intervention during this process which sets up the effective communication and work practices between the healthcare professionals for when the service is funded, would avoid some of the frustrations evident. Regional pharmacists groups such as

Community Canterbury Pharmacy Group[31] network offer advice on the present course and on getting through part D of the course to complete the accreditation.

Employers may also be stakeholders who initiate training. Pegasus Health, while not directly operating pharmacies are involved in on-going clinical training for the prescribing practice of GPs and nurses. Pharmacy Brands are the parent company to over two hundred and seventy three pharmacies under the names Unichem, Amcal, Radius and Care Chemist but have no direct role in CPD but could offer courses for their franchise holders.[32]

The danger of too much uncoordinated support from different sources with conflicting advice could paralyze the end user into not participating. Above all else the model suggested that, outside the need for compliance for registration in New Zealand, pharmacists need good advice and guidelines not just on specific on-line courses but how to judge the quality of a course. This conclusion forms one of the recommendations presented in Chapter 7.

[31] http://www.ccpg.org.nz/medication-management-service/how-to-get-accredited/

[32] http://www.stuff.co.nz/business/opinion/4880969/PBLs-adventure-could-have-big-consequences

6.5 A Model of the Environment for Planning Training (EPT)
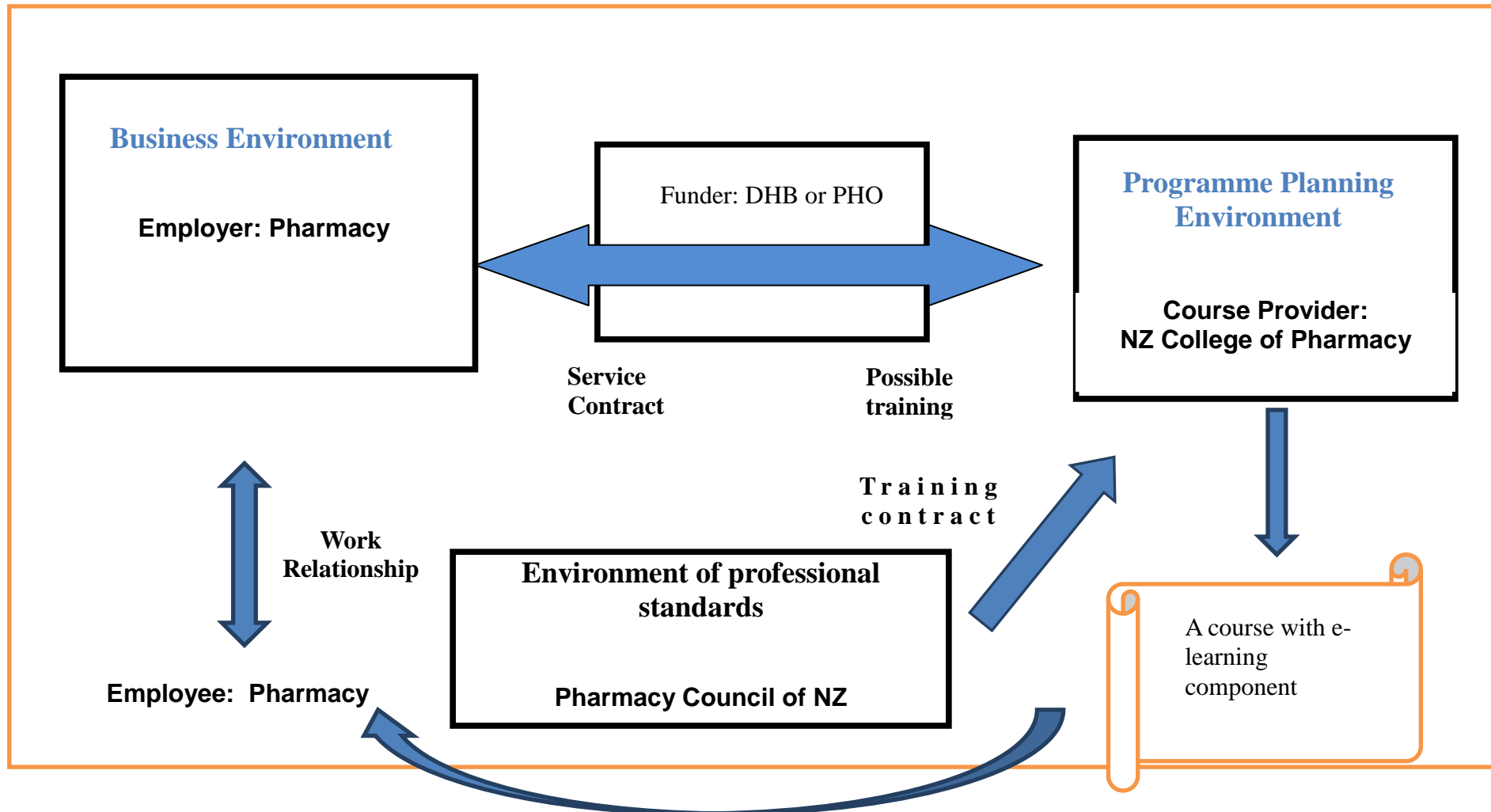
Figure 11 Environment for Planning Training of the MUR Service

While there were parts of the model which would be applicable to overseas healthcare services, it is uniquely New Zealand largely because of the State Funded model of payment for the medications.

6.6 The role of evaluation

Evaluation and feedback are two factors feeding into the training planning process but without the validation, then improvement and targeting of resources becomes guess work. As Warren (nd) claimed 'Ultimately, if evaluation is conducted systematically and integrated into the planning process, the program planner has a greater chance at gaining evidence of the purposes intended' (p.5). [33] Introducing a short discussion on evaluation was considered important because there is a need to provide criteria for selecting and trialing learning tools for potential e-learning courses.

Evaluation impacts on three levels within the EPT model. Three types of evaluations emerge from the relationship between stakeholders in the EPT model and outside the EPT model. Changes in stakeholders' position in policy and funding for the MUR service maybe initiated by or result from outcomes of these three evaluations

- the MUR service
- the training course
- the pharmacists' performance in their work. (this might be related to the training assessment used)

Trying to cover all three types of evaluation in one evaluation tool would be ambitious. The process of evaluation can be invasive to practice and demotivating if it is seen as being conducted for the sake of it without an obvious link to any of the decision-making processes used by the stakeholders. Most relevant to this discussion is the point that any evaluation of the

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[33] http://www.hiceducation.org/Edu_Proceedings/Ruth%20M.%20Warren.pdf

effectiveness of an e-learning course would need to be for just the role it played in delivering content and not on any role for patching up wider service or funding problems.

Finding ways to be clear about what is being evaluated and for whom, is not unique to these situations. The costs and benefits across a healthcare service such as the MUR or MMS, including the training, may not be directly identifiable to a particular organisation. Cullen, Howell, & Martin, (2011) in a paper presented at HINZ conference late 2011 claimed evaluating the return on investment for Health IT interventions such as telehealth monitoring, suggested that the evaluation process needs to include benefits and costs seen from the perspective of the different stakeholders. (p.89). This idea of having an inclusive evaluation process which can be used from different perspectives may go some way to avoid burdening healthcare workers with too many evaluation processes.

Several methodologies for evaluation (and assessment) have been identified in the project, some of which will be referred to in the last two sections of this discussion, which aims to give some insight into what could be possible.

6.6.1 Evaluating the MUR service and professionals' practice.

The use of the case study method allowed for a view of MUR service and the training for it from a variety of stakeholders involved. Winslade, Tamblyn, Taylor, Schuwirth, & Van der Vleuten, (2007) developed a comprehensive model for measuring community pharmacist performance in the United States with a similar perspective. Factors that were included in this evaluation model came from multiple stakeholders, the individual pharmacist, the patient, the pharmacy work place/team, the organisation that owned the site and the healthcare system. One suggestion made by the authors was that assessment tools used for other healthcare professionals should be adapted before being applied to pharmacists' evaluation. Perhaps this also could apply

if an interprofessional training course involved measuring competencies for evidence based practice (EBP) (Ilic, 2009, p. 1). This evidence as either formative or summative assessment could be found in areas of a pharmacists' work such as in their communications and paper-work, which other healthcare professionals do not receive. According to Ilic, (2009, p1) there are few tools which are currently available to assess this; any tools developed would need to accommodate the impact that they would have on behaviour during assessment.

One important aspect of this would be the transfer of skills from the course to practice. Dualde et al. (2009) attempted to measure this, (see page 39 in Literature Review Chapter). The results showed that even though the transfer of skills was not achieved, the model used was robust. The question of validity is fundamental to evaluation and has been tackled head-on in a developing model, based on Messick's framework as described by Ruhe & Zumbo (2009).

These examples of the evaluations for the service and pharmacists' practice seem a long way from what can be gleamed on the evaluation of the current MUR in New Zealand that has been made available in the public arena. As mentioned in section 5.3.1 there was a distinction between the MUR services being useful to a healthcare consumer and its usefulness to a DHB in meeting health outcomes. Figure 6 indicated most pharmacists in this study considered the service useful for communication with other healthcare professionals, for getting to know their patients better, and getting to know the adherence issues in their local community. The numbers of MURs completed by respondents varied although there has been no need to restrict the referral process as was the case in the UK. The editorial by Holland et al., (2006), referred to earlier, about the state of MUR in 2006 in the United Kingdom claimed evaluation of MURs needed measureable outcomes that ideally linked behavior changes around pill taking behavior to patient hospitalizations, as well including quality of life assessments for patients. The authors conceded

that 'The most successful interventions have been delivered by small numbers of pharmacists working in close liaison with primary care physicians' (p. 92). Respondents in this study, who described successfully working MUR structures also referred to this close liaison with GPs. Finding measurable outcomes for this, could be useful future research.

Public data is available for similar services overseas, such as the HMR in Australia. Aslani & Krass, (2009) claimed 'there are currently 1794 pharmacists in Australia accredited to deliver home medicines reviews. The data from Medicare Australia indicate that 189,108 HMRs have been claimed by health professionals' (p.4). It would make a more open and transparent evaluation process if such statistics were available in New Zealand. An example of a study that did attempt to put economic values on a pharmacists' intervention was Avery et al., (2010) which had a different focus, where the medical harm related to prescribing errors was reduced through pharmacists' intervention. This random controlled trial had economic indicators as part of the outcomes. These and similar studies were attempting to pin down measurable outcomes, vital evidence needed to justify the interventions.

6.6.2 Evaluating e-learning components

Bury et al., (2006, p.24) wrote about this need for evidence that e-learning works with its place firmly set in the NHS's healthcare training strategy. If e-learning was to be accepted by pharmacy professionals and healthcare workers in general, as a useful alternative to traditional training delivery, then evidence needs to be available to direct this strategy to the most effective teaching methods.

Another in-depth process was used in the evaluations of a high fidelity simulation for pediatric residences, Adler, Trainor, Siddall, & McGaghie, (2007) developed a systematic approach for the evaluation of high-fidelity simulations. The virtual simulations used an

interactive mannequin for assessment in a pediatric residency programme at the Children's

Memorial Hospital in Chicago, United States. The evaluation of the cases built up to utilise the

mannequin was through raters observing on video the residents' practise during engagement in a

simulation. Each rater used a checklist which was developed over a year and 'had 20 to 30 items

at initial development, a number chosen to balance rater effort with the need to have

representative items' (p. 183). This process could be used to evaluate the transfer of skills to

practice after completing an on-line course.

Multiple evaluations of both knowledge and skill from a variety of sources are needed to

assess general clinical competence. 'In this study, we describe the initial process of case

development and validation. We plan a series of simulation cases, covering a number of

competency domains, which will have sufficient areas of overlap to achieve generalisability. We

intend to use these cases as part of a formative evaluation process for our residency training

program'(Adler et al., 2007, p. 185).

Leikola et al., (2009) evaluated the Comprehensive Mediation Reviews (CMR) course (see

page 47) with an on-line survey administered by University of Kuopio, Centre for Training and

Development one month after the course completion. This was a reasonable time to allow for

evidence of transfer to practise but one which means the respondents were relying on recall

about specifics of the course. This was not specifically about the on-line discussion component

of the training but did include questions on application to practice. They used the following

open-ended questions ' (1) What factors facilitated your learning in this training?; (2) What

factors prevented or hampered your learning in this training?; (3) What did you learn and how

can you apply it to practice?; (4) What ideas, comments and suggestions do you have for the

improvement of the training' (Leikola et al., 2009, p. 5).

Lymn, Bath-Hextall, & Wharrad, (2008) evaluation of the use by nurses of pharmacology reusable learning objects (RLO) is another example. There was no interaction between students in the use. 'All RLOs were evaluated extremely positively by the students and telephone interviews with a small sample of students suggested that the RLOs were continuing to be used to support learning post-qualification and that a number of students felt their prescribing confidence was due, at least in part, to these educational tools' (p. 10).

Maio et al., (2003 p.1648) described a practical and potentially useful research design. Contacting a group of professionals like pharmacists to complete an on-line questionnaire, is perhaps best recruited by a more formal letter of introduction than an email or an ad on a webpage. The final sample pool of 383 in their study was still not considered large enough to make any conclusive generalisations about the United States pharmacist as a professional body. What was interesting was that at that response level they did indicate that demographics of pharmacists as potentially influencing what preferences they had for content delivery. Whether being able to make generalizations is based on the proportion of a sample to a total of the professional body for a nation is one consideration for any research aiming to investigate this issue.

Lastly Ruhe, (2009) stated several reasons, as mentioned earlier why developing and using a professional approach to evaluation of e-learning courses and programmes was becoming more important. E-learning can be included in a wider definition of distance learning programmes. 'Messick's (1989) four faceted conception of validity brings scientific evidence, values and consequences together in a single model' cited in (Ruhe, 2009, p. 93). Ethical considerations are important. In terms of the stakeholders interested in the outcomes of an evaluation, those

identified in the model and others mentioned in section 6.4.3 would have different expectations

of outcomes.

Chapter 7
Conclusions and Recommendations

This project presented the opportunity to look at the MUR service as a unique case study of a New Zealand healthcare service. The problems with national-wide access to the MUR service resulted in barriers to patients receiving support needed in adhering to their medication regimes. The results from this research confirmed a range of these problems, including the frustrations of pharmacists who, after completing the training, could not offer the service because it was not funded in the region they worked in. The focus of analysis of the case-study was the identification of factors which could motivate training providers to take advantages of e-learning as a cost-effective solution for future MUR training for pharmacists.

A model was devised of the environment in which planning the MUR training course is done. The training environment is complex and just what content would be included in future MUR courses, has an element of guess work. Two factors are more certain;

Firstly, continued funding by some DHBs regions coupled with determination by community pharmacy networks to provide the MUR service may still not solve service access issues. The shortest possible lead time is needed if training or up-skilling of staff is required. The process of delivering this training to pharmacists via e-learning should not wait to be led by other healthcare sectors or organisations, but should still utilise any support offered from DHB, Ministry of Health and private enterprise.

Secondly, the stumbling blocks as with all education are maintaining quality and evaluation of effectiveness of both course and transfer of learning. Training for busy professionals such as

pharmacists needs to be relevant and transferable to practice. With CPD and e-learning both

needing a level of self-directed learning and reflective practice, this commonality would work for

motivated professionals. For the training provider the EPT model offers a way to see the

stakeholders' role in the service as equally important therefore a healthcare service wide view

can be taken before setting performance indicators. [34] Any evaluation of an on-course is seen in

the context of the healthcare service.

There are five recommendations to be considered as practical outcomes of this research

project.

These are:

i.   There needs to be a national-wide survey to capture the skills and technology base for

e-learning from which pharmacists would work. The skill base for each work site or

organisation could be seen as a collective asset and not as an individual staff

competition.

ii.   There needs to be a standardised process, devised by organisations supporting

pharmacies, which allows pharmacies to evaluate e-learning resources both from New

Zealand and overseas. The process of putting this together could include the

Pharmacy Guild of New Zealand, regional pharmacy networks and stakeholder

education organisations. This could include a repository which allows pharmacists to

rate the courses and suggestions on how to get the most from the course.

iii.   Any on-line MUR course or programme needs to have input from both pharmacists

and instructional designers. In delivery of the course or programme there needs to be

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[34]   http://www.gslis.utexas.edu/~ssoy/usesusers/l391d1b.htm

technical support and experienced facilitators so collective participation in the activities has the best chance of moving through the stages needed for CoP.

iv. Special attention should be given to the success and failure of interprofessional training. Even if there is a positive outcome for the service in which the multiprofessional team is working in, the outcomes for each professional group needs to be recognised within CPD for that group.

v. A repository of MUR case-studies, much like that used in the MUR service in the United Kingdom could be set-up.

7.1 Future Research Directions

- A national survey of community pharmacies in New Zealand needs to be undertaken to capture the skills and technology base for e-learning for individual pharmacists and for the workplace. Such a project could identify issues in both willingness and level of support needed for participation in CDP courses delivered on-line.

- Any development of on-line training course for pharmacists should be subject to rigorous examination though research, perhaps utlising the methodologies described in this research. To locate this in a New Zealand context would allow for factors, such as set-up costs and on-going benefits to be localised. This research could also attempt to establish and provide insight into interconnectedness of different content areas of the MUR service. An example for future courses was the possible association between promoting the MUR service and information management.

- Research by educators involved in delivering an on-line course to establish evidence of tutoring/facilitation techniques which promote transference of behaviour change after

course activities to professional practice. An example would be finding the mechanisms

which mentoring and facilitation in on-line peer discussions increased participation.

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Appendix A – MUR Related Documentation

The details of three MUR documents are included. These are

The official MUR consultation forms from the PCNZ.

A MUR Training Information Sheet.

A MUR Care Plan Template.