



National Shared Care Planning Programme (NSCPP) Evaluation

Findings for Phase 0 & Phase 1

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Foreword

The National Health IT Plan proposes an improved and rationalised health IT infrastructure for New Zealand that will ultimately support a transformed and more sustainable healthcare system. At the centre of this plan is “shared care planning,” which is built on the principle of facilitating and enabling an “integrated healthcare model.”

This report provides results from the evaluation of the National Shared Care Planning Programme (NSCPP) in New Zealand as the programme approaches the wrap-up of Phase 1 Limited Deployment of NSCPP. The evaluation, including the preparation of this report, has been undertaken by the National Institute for Health Innovation (NIHI) under commission of the National Health IT Board (NHITB).

The report is based on quantitative and qualitative data acquired through 31 October 2011. Draft versions of the report have been circulated to operational and steering group stakeholders. This has served both to provide information to support ongoing decision making with respect to Phase 2, as well as to elicit feedback on the completeness and correctness of our analysis. We are thankful for the constructive feedback we have received, and particularly acknowledge the contributions of Eileen McKinlay, Janine Bycroft, Ernie Newman and Robert Doughty with respect to the present report and earlier interim documents.

NIHI would like to record our gratitude for the cooperation of all the people who actively assisted in this review. Direct quotations from participants are included in the report to support its conclusions. Where this is done, they are included with permission of the participants. In general, however, we have aimed to preserve the anonymity of stakeholders so they could express their opinions freely.

Core findings which may be relevant to health IT innovators globally will be prepared for submission to peer review with an academic journal.

Note that this evaluation, including its reporting and results dissemination, has been conducted in accordance with the Framework for Health IT Evaluation that has been developed by NIHI based on experience in health IT innovation evaluations in New Zealand.

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1 Executive summary

1.1 Key conclusions

The 'Phase 0: Exploration' and 'Phase 1: Limited Deployment' phases of the National Shared Care Planning Programme (NSCPP) have reached their objectives of achieving an IT-enabled shared care planning (SCP) method into which a substantial number of patients have been enrolled and undergone care planning mediated by the CCMS software. That said, the success is marginal in a number of areas, with room for improvement particularly in terms of fit of the software interaction to common communications needs amongst providers and in terms of identifying a workable proof-of-concept for patients as active online users. Also, the central role of nurses as key users should be more fully acknowledged in terms of project emphasis, including governance and reporting.

Room for improvement in terms of fit to common provider communication needs and workable proof-of-concept for patients

Phase 2 (designated as 'Wide Deployment') should commence with a period of redesign on the software interface and associated clarification of protocols for care team members, particularly around timely receipt of SCP-related communications and procedures for follow-up of incomplete or incorrect medication data. In parallel, new providers can be recruited for a controlled scale-up of the user base. As Phase 2 scale-up ensues, there must be a concerted work stream to develop and refine the patient user interface to CCMS in a manner that suits both the patients and their providers (effectively, a 'Patient Proof-of-Concept' phase). Evaluation activities should assess the success of the re-design and ongoing Patient Proof-of-Concept, and look for secondary access by non-care team members, as well as reviewing how provider roles and responsibilities are being transformed. The evaluation of Phase 2 should conclude with examining changes in standardised scores of patients and provider organisations measured in Phase 1 as well as a panel assessment of the quality of management of a selection of cases.

Phase 2 should commence with a period of redesign on the software interface and associated clarification of protocols for care team members

1.2 Background

The National Shared Care Planning Programme (NSCPP) has been formed to initiate pilot projects which investigate approaches to implement shared care planning as an enabler to support long-term condition management.¹ healthAlliance, working with Auckland Regional District Health Boards (DHB) and primary/community health care providers is contracted by

the National Health IT Board to manage NSCPP. HSAGlobal is the selected vendor for the technology solution – the Collaborative Care Management Solution (CCMS).

The NSCPP implementation has been designed to run in three phases:

1. Phase 0: Exploration, also called the Proof of Concept Phase, from March 2011 to June 2011 with one general practice: Grey Lynn Family Medical Centre and one DHB service: Auckland DHB Heart Failure Service
2. Phase 1: Limited Deployment (July – December 2011), extending from Phase 0 to eight general practices, five DHB services (ADHB Heart Failure Service, Counties Manukau DHB Rheumatology Service, Waitemata DHB Acute Intervention Respiratory Service, CMDHB Whitiara Diabetes Service and ADHB Diabetes Service) and four community pharmacies.
3. Phase 2: Wide Deployment (in planning, currently expected to run through the end of June 2012).

The National Institute for Health Innovation (NIHI) has been commissioned by the National Health IT Board of New Zealand to evaluate the first two phases. The evaluation for Phase 2 is still to be determined; the current Phase 0&1 report provides both information on the existing implementation and recommendations on the Phase 2 evaluation approach. These evaluation studies are intended to provide constructive feedback to the programme and to inform others who are planning similar shared care planning approaches.

1.3 Methods

An assessment framework for the evaluation was devised based on four domains: health outcome, social, technology and economic. Evaluation data was gathered between March and early November 2011 through collection of project documentation, participation at programme meetings and workshops, and conducting interviews and a provider forum, as well as by analysis of electronic transactional records and of questionnaire responses. Data was analysed from CCMS transactional records (extracted for the period from commencement of operation on 21 February 2011 through to 31 October 2011) and stakeholder questionnaire responses. Patients were administered the Patient Assessment of Chronic Illness Care (PACIC), the Partners in Health (PIH) tool and the abridged Morisky medication adherence tool. Health provider organisations completed the Assessment of Chronic Illness Care (ACIC) tool. Direct interviews and a forum involved over 40 participating stakeholders, including managers, vendors, patients and clinicians.

1.4 The solution

CCMS – to assist shared care; to facilitate care planning; to support communication

The technology solution of NSCPP, HSAGlobal's CCMS (Collaborative Care Management Solution), is a web-based clinical case management care planning solution. It is designed to assist shared care planning by sharing both patient records (e.g. diagnoses, measurement results, medications, notes and record summary) and planned care activity (care plans and related care activity) among multiple care team members. This care team may include members from different organisations who are active in the patient's health care (e.g. specialists, GP, pharmacist, community nurse). CCMS also provides communication support through features regarding notes and tasks.

CCMS has achieved a degree of interoperability with general practice PMS (practice management system) software (MyPractice in Phase 0, and also MedTech32 in Phase 1) and with secondary clinical information systems (Orion Concerto in Phase 1). While iterative refinement of the interoperability protocols was (as intended) most active during and immediately following Phase 0, extension and modification of the inter-system data exchange mechanisms has continued throughout Phase 1.

Training for using CCMS was delivered to participating providers by either the technology vendor (HSAGlobal) or the healthAlliance support team.

1.5 Findings

*Phase 0: 1 general practice, 1 DHB speciality service;
Phase 1: 8 general practice, 5 DHB speciality services,
4 community pharmacies, 73 Patients*

The evaluation team has analysed a total of 267 NSCPP project documents, participated at over 40 programme meetings and workshops, conducted interviews and a provider forum with over 40 individual health care provider participants, three patients and seven project management team members, collected baseline questionnaire responses (including ACIC responses from 23 individuals at nine organisations and PACIC/PIH/Morisky responses from 53 patients), and analysed CCMS electronic transactional records (including 91 notes, 371 task entries and 21,922 audit log entries). As of 31 October 2011 activities from eight general practices and five secondary services regarding 73 patients have been recorded in CCMS. Among these enrolled patients, 48 have care plans created and eight have been provided with Patient Portal access.

These data indicate that providers were able to use CCMS to undertake care planning and have substantive electronically mediated communications about management of patients' conditions. There are, however, a number of outstanding issues in terms of system usability, provider protocols for timely interaction, how best to engage patients as users, and associated transformation of workflow and roles.

In terms of the assessment framework domains, we find the following:

- **Health Outcomes.** There is a perception of improved patient motivation and overall health service experience through goal setting and shared information. Primary and secondary team members are able to use CCMS to set tasks for one another and communicate about patient status and management plans. Moreover, the process of SCP encourages improvement of health record quality (e.g. in terms of medication and problem lists). There is also the potential for SCP record access by providers outside of the direct care team.
- **Social.** There is strong in-principle support for shared care, although it is often difficult to fit to practice workflow. There is the challenge of staff having time, and skills, for shared care planning. Moreover, there is a need to better define modes for patient participation and for change management support overall.
- **Technology.** The software is feasible to use for conversations around coordination of care, but requires use-case based re-design of the user interface and clearer expectations of users
- **Economic.** Review of existing funding models is required to accommodate the 'work' of SCP. A key challenge is that savings will often come to different group than those making the major shared care effort

1.6 Conclusions and recommendations

Phases 0 and 1 have demonstrated software-mediated communications for shared care planning (SCP) amongst primary and secondary care providers. Continuation into Phase 2: Wider Deployment is clearly warranted. Many fundamental questions remain, however: in terms of the means and extent of the active role of the patient; expectations of nurses and physicians in terms of explicit SCP activities; and the extent to which the emphasis of SCP falls on proactive care planning as compared to enhanced mediation of more ad hoc communications around a shared record.

Phases 0 and 1 should be regarded as having been extremely valuable for providing a wealth of insights into electronically mediated shared care planning for New Zealand. There were rich and productive interactions among the software vendor team, project team and user community (and, indeed, the NIHI evaluators) throughout the months of the trial. Phase 0 provided clear benefits in terms of efficient early identification of technical barriers and identification of training/induction requirements for Phase 1. This staged approach should be considered as a model for other projects involving highly innovative and potentially transformational use of IT. In addition to the explicit learning about SCP, the exercise has provided capacity building through experience and interaction, particularly in terms of the dozens of providers, and nearly 100 patients, who have been exposed to the experience of IT-enabled SCP. They will now be much more sophisticated consumers of future offerings and provide a widened base of potential trainers and advocates for subsequent phase of NSCPP or related programmes.

Specific Considerations for Phase 2

The following areas require specific consideration as the project moves into Phase 2:

1. Increase the Design Focus on Intra-team Communication Mechanisms. We believe it is critical that the interaction be redesigned with respect to communication of task assignments and other messages within the care team using CCMS and the subsequent recording of that activity as a record. Equally, the expectations of participating users to receive and acknowledge communications from other team members must be clarified. HSA Global should work with users to create a few key communications use cases and establish clear user-interface functionality and usage expectations for care team members.
2. Embrace the Key Role of Nurses. The majority of CCMS use so far is by nurses, and this is likely to be the continuing trend. While physician engagement is essential, nurse activity will be central to care plan formulation and overall shared care execution. The project should reflect this in terms of increasing the emphasis on input from nurses, including expanding the influence of nurses in the project governance, as well as greater communication of interim results to nurses (e.g. to the Nursing Council). Nurses should feature as the key hands-on users in software interaction re-design (however, as per 1 above, ensuring responsiveness from other users is critical).
3. Go for Best-Value Patient Cohorts While We Wait for a More Definite Business Model. Establishing a business model to compensate for care planning activity remains an open issue; however there appears to be room for advancement by focusing on a few specific patient groups, including those who already take a large enough amount of shared management effort (e.g. renal, palliative); where there are large numbers of patients with high frequency of hospital interactions (e.g. people with diabetes, COPD and cardiovascular disease); and services where a shared care plan framework would facilitate an existing process (e.g. Advanced Care Planning). Whichever direction is chosen for expansion of the SCP cohort, clarity of recruitment criteria and enrolment protocol is essential since such activities are outside 'business as usual'.
4. Undertake Use-Case Driven User interface Re-design Now. The software solution is still unwieldy for promoting increased uptake. Overall, the system would benefit from use case driven redesign along the lines recommended for task communications as per above. These are superficial software changes from an architectural perspective, but they need to be done systematically through an Interaction Design process with user engagement – they cannot be treated as a 'bug fix'.
5. Initiate a 'Proof of Concept' for the Patient Role. Although a handful of users have been given access to limited CCMS functionality, the role of patients as active users of CCMS has been largely unexplored in Phase 1. The limited promotion and depth of patient-as-user functions to date is disappointing given the underlying philosophy of shared care. Consensus must be reached on how and when a patient can post questions to the care team, as well as how patients may exercise other capabilities such as posting goals, notes and observations. Phase 2 must aggressively explore the patient role and push to establish broader experience with patients providing online input into the shared care system. Essentially, we need to revisit the ethos of the Phase 0 'Proof of Concept' but this time with the patients as the key users that are driving the software tailoring and modification process. Like Phase 0, this will need to be an activity

spanning a few months and with close interaction of the software vendor, project team and users.

6. Agree on Way of Working with Imperfect Online Medication Lists. Medication lists imported to CCMS often contain past medications that the patient is not currently taking. At the core of this problem is that general practice PMS software has been performing a functional role with medication – to print prescriptions – that is not the same as providing a reference record of current medication. Automated extraction from the PMS database exposes this subtle difference. While incorrect medication lists pose a safety concern, physicians are accustomed to a lack of reliability in medication records and are innately cautious in this regard. The situation is suboptimal, but we believe it is best tolerated for the time being. Numerous projects are moving to improve the situation (e.g. with respect to better and more structured medication lists on hospital discharge). Share Care Planning should contribute to the demand for more systematic and comprehensive medication data management, but should not be put on hold to wait for it. For Phase 2 there should be agreed protocols for communicating about suspected inaccuracies in medication records of the CCMS and of source systems, notably the GP PMS.
7. Plan for Secondary non-Care Team Use. There is the potential for 'low hanging fruit' in direct health benefits when secondary providers outside of the care team can view the shared care record. The record could provide valuable, even life-saving, context when a patient presents to the Emergency Department or other hospital services. This benefit is unrealised at present because there are simply too few NSCPP patients for knowledge of the record and its mode of access to become an active part of hospital staff awareness. Engagement of Orion Health to explore optimal and consistent placement of the shared care data in Concerto will facilitate benefits in this area. Phase 2 should have an explicit plan for how and when to undertake concerted communication to the broader secondary care community about availability of CCMS data, including clear policies for appropriate access.

Phase 2 Evaluation Plan

We recommend the several streams of evaluation activity through Phase 2. In chronological order of commencement these are:

1. Evaluation of interaction re-design. This would start with observation of the use-case driven Interaction Design sessions and associated revisions of user protocols and training. The redesign will culminate in a revised CCMS user interface and associated training materials. The evaluation team should continue to collect user feedback regarding usability of the system throughout Phase 2.
2. Evaluation of "Proof-of-Concept" for Patients. The experience of patients as CCMS users must be more fully enabled. Working closely with the software vendor, patients will be the key drivers of the requirements. Providers, however, must be kept in-the-loop to ensure the interactions are feasible and acceptable within their workflow and constraints.

3. Measuring non-Care Team Secondary Access. As recommended, a plan should be enacted to ramp up secondary access to CCMS by secondary staff who are not members of the care team, such as ED staff encountered enrolled patients. The evaluation should include quantitative tracking of the rate of CCMS record views by such users over time to establish that an increase is achieved, as well as a qualitative arm based on interviews of non-care team secondary users to establish how well the CCMS data is meeting their requirements.
4. Review of provider role and responsibility transformations. SCP goes beyond 'business as usual'. Participant interviews should continue to probe how users are doing things differently than they would with respect to similar patients under 'usual care'. The areas where new activity is providing improved care, particularly improved care that may benefit teams and organisations other than those directly engaged in the activity (e.g. as with a general practice care plan reducing hospitalisation risk), will provide guidance for formulation of new job descriptions and reward schemes, as well as informing future cost-benefit models of SCP.
5. Re-visiting Baseline Measures on Patients and Provider Organisations. Substantial cohorts of patients and practices have now had baseline assessment on internationally-recognised scales during Phase 1. These specific patients and practices should (if they consent) be reassessed at the end of Phase 2, thus providing quantitative measures of process improvement based on around 9 months of SCP experience.
6. Case Review by Expert Panel. SCP should lead to improved adherence to evidence based guidelines for appropriate management of patients' long-term conditions. It is recommended that an expert panel of individuals, including specialist and GP physicians and not previously involved in any of the CCMS-based care delivery in Phases 0-2, review a selection of cases from among the enrolled patients managed in Phase 2.

The above activities should be performed under a new research ethics protocol approved by the Northern X or Y ethics committees.

Limitations

This study has a number of inherent limitations. Most notably, there is no basis for direct measurement of SCP contribution to outcomes such as improved health status or cost benefits. The recruitment method offers no clear opportunity to construct a control group. The limited duration of SCP activities is insufficient to expect major transformation of patient experience. Thus the analysis has focused on qualitative and quantitative process measures, including user feedback, usability, uptake and the content of system-mediated communications.

Dissemination

The present report, after accommodation of stakeholder feedback, is to be made publically available. Select elements will be prepared for academic peer-review and publication.

2 Overview

The National Shared Care Planning Programme (NSCPP) is at the core of the Government's strategy for using technology as an enabler to deliver health outcomes that:

- Deliver connected care to patients, particularly benefiting those with long term and chronic conditions
- Enable more active involvement of patients and their families in their planning of care
- Improve the efficiency and effectiveness of the health system

healthAlliance, working with regional District Health Board (DHB) and primary/community providers in the Northern Region, is contracted by the National Health IT Board to manage NSCPP. HSAGlobal is the selected vendor for the programme's technology solution – the Collaborative Care Management Solution (CCMS). The NSCPP implementation is designed to run in three phases, as depicted in Figure 1:

- Phase 0: Exploration, also called the Proof of Concept Phase, from March 2011 to June 2011 with one general practice: Grey Lynn Family Medical Centre and one DHB service: Auckland DHB Heart Failure Service
- Phase 1: Limited Deployment (July – December 2011), extending from Phase 0 to eight general practices, five DHB services (ADHB Heart Failure Service, Counties Manukau DHB Rheumatology Service, Waitemata DHB Acute Intervention Respiratory Service, CMDHB Whitiara Diabetes Service and ADHB Diabetes Service) and four community pharmacies.
- Phase 2: Wide Deployment (in planning, currently expected to run through the end of June 2012).

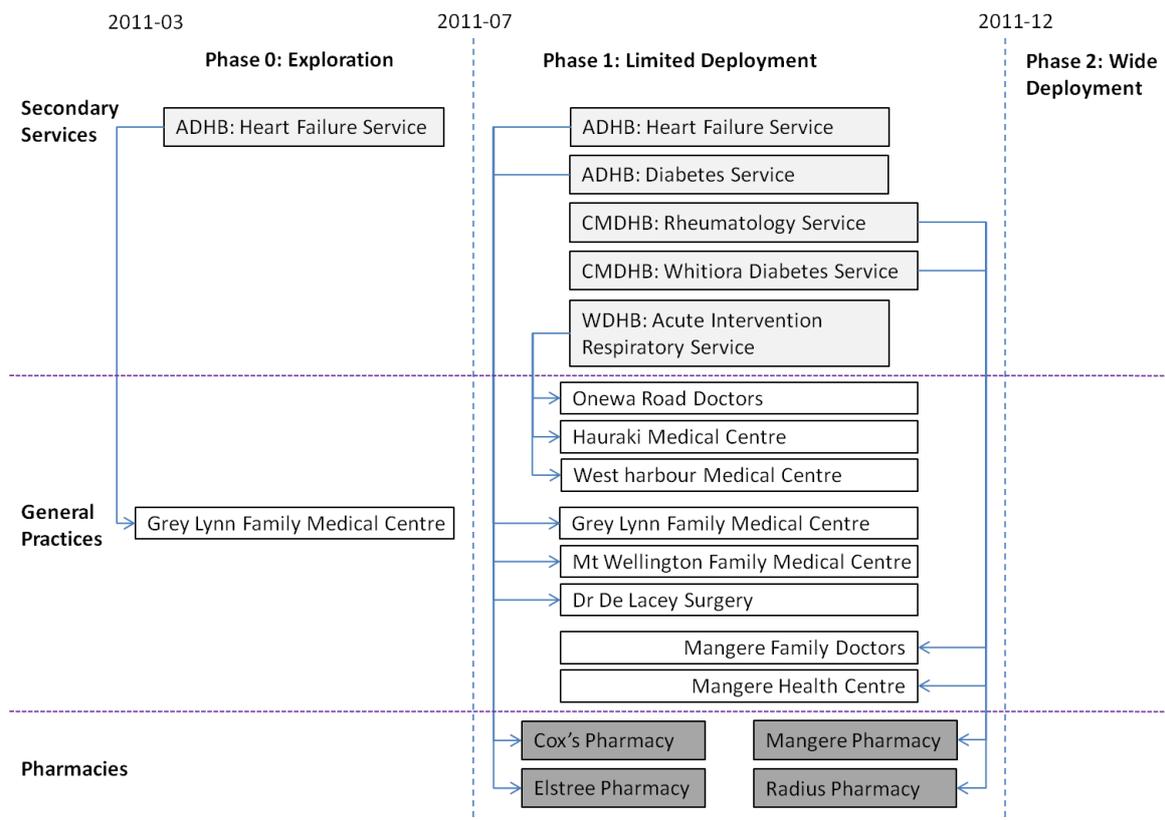


Figure 1. NSCPP Phases and Timeframe

The National Institute for Health Innovation (NIHI) has been commissioned by the National Health IT Board (NHITB) to undertake evaluation of the NSCPP during Phase 0: Exploration and Phase 1: Limited Deployment. NIHI provided recommendations and interim findings to the NSCPP Steering Group periodically throughout the project, including an interim report on 31 May and a set of recommendations on Phase 2 directions in late October. The current document represents the final analysis across the data from Phase 0 and Phase 1, including a refined and expanded version of the October recommendations.

The NSCPP evaluation study is intended to provide constructive feedback to the programme while it is implementing the shared care planning programme using innovation technology. The evaluation applies a general framework developed by NIHI for evaluation of innovative health IT projects. This framework² was developed for the NHITB as a tool to systematically review innovative IT-enabled health projects with an emphasis on dissemination of lessons learnt. The present evaluation report will be published to the Health Innovation Exchange (HIVE, <http://www.hive.org.nz>), as is the evaluation framework itself.

The specific evaluation plan for Phase 2 Wide Deployment of NSCPP is still to be determined; the current report provides recommendations on the Phase 2 evaluation approach.

2.1 Shared Care Planning

The shared care planning model is based on the assumption that with shared information and shared care planning, all stakeholders will have access to more timely and pertinent supporting information. The logic of this argument is that providing the stakeholder with this shared information will enable increased involvement in supporting a person – or self-supporting, in the case of the patient – while reducing the overall unplanned and preventable demand for health services. This in turn suggests that the consistent ability to access and base decisions on accurate, timely and relevant shared information will in turn enable all parties, including patients, to obtain additional skills and knowledge in relation to their roles and functions, resulting in, for example: improved diagnosis and treatment considerations by health teams; and real behavioural changes such as medicine adherence or smoking cessation by patients.

The evidence base for shared care planning activities is reported in the UK³⁻⁵, US⁶⁻¹³, Australia¹⁴⁻¹⁶ and Canada.¹⁷ The approach taken often emphasizes either shared care or care planning. In the literature, the concept of “shared care” has synergies with terms such as “co-ordinated care”, “collaborative care” and “integrated care”. A literature review on chronic care management relevant to shared care is attached in Appendix A: Literature Review.

Shared care is “an approach to care which uses the skills and knowledge of a range of health professionals who share joint responsibility in relation to an individual’s care.”¹⁸

Collaborative intervention using E.H. Wagner’s Chronic Care Model (CCM)¹⁹, which can be seen as a type of shared care, has lowered the cardiovascular disease risk factors of patients with diabetes²⁰. However, a systematic review on sharing care across the primary care / hospital specialty interface in chronic disease management found no consistent improvements in physical or mental health outcomes, psychosocial outcomes, hospital admissions, default or participation rates, recording of risk factors and satisfaction with treatment.²¹ Another review has concluded though that “integrated care programmes seemed to have positive effects on the quality of care.”²² Chomik’s review of British Columbia shared care projects identified both potential benefits and challenges associated with defining and implementing shared care models.¹⁷ Experience and evidence show that collaborative care needs to include patient-, provider-, and system-level components as described in Wagner’s CCM.²³

Shared care planning initiatives have been reported to improve communication between healthcare providers.²⁴ The shared care planning approach is particularly designed to involve patients themselves in facilitating patient-centred care. The ongoing relationship with the individual at the centre of their own care plan should focus on learning about their needs, such as life and health goals, past treatment experiences and preferences, their strengths and resources, and the barriers they face.²⁵ Collaborative care planning is the process in which all those involved in the organising, provision and receipt of care for a given patient are actively involved in the planning and decision-making surrounding what that care involves over a given time period.²⁶

A “**care plan**” is defined as “a structured, comprehensive plan developed by the patient and their significant others, carers and health professional(s).”²⁶ This care plan defines problems, goals, actions, time frames and accountability of all involved, to prevent complications and deterioration of chronic conditions.²⁶ This care plan should contain:

- Patient defined problems;
- Patient defined goals;
- Medical management;
- A prioritised action plan based on the self-management needs of the patient and their carer;
- Community education programmes or resources;
- Community support networks; and
- Time for review and follow-up. This includes the flexibility to acknowledge and anticipate unexpected emergent events arising from co-morbidity and/or increasing frailty and some direction as to what should be done in that circumstance.²⁷

2.2 Study goals

Key goals of the present NSCPP evaluations are to answer:

- Did the shared care planning approach work? Did the technology effectively support the approach? Was it acceptable to and workable for the care team, patients and carers?
- What difference did it make? Did the model of clinical care change? Did it encourage patient participation in their care? What indicators emerged that demonstrate improvements in the efficiency and effectiveness of care provision? What unexpected outcomes emerged and how did they support the processes and/or were overcome?

With respect to each of these goals investigations of both the positive and negative aspects are considered equally – what comes through as a benefit, and what constitutes hard-won knowledge from the setbacks that must be expected in pioneering projects? Multiple perspectives were sought with the intent to create a dimensional view rather than a single positivist end point. Moreover, it is relevant to understand how what was delivered varied from the original expectations (for better or worse), and what further changes are still desired for each group to measure success. The aim of this evaluation is to inform and guide the further development of and deployment of such approaches for NZ health delivery.

In the remainder of this report, we describe our findings from evaluation of the NSCPP implementation in Phase 0 and Phase 1. In the following sections we first describe our methodology for the evaluation (i.e. how we went about it, including rationale) and then provide the results. We then reflect on the implications of those results in the Discussion section and finally provide concise conclusions and recommendations.

At the time of this report, Phase 0: Exploration is completed and Phase 1: Limited Deployment is wrapping up; planning for Phase 2: Wide Deployment is under way.

3 Methodology

Evaluation data was gathered between March and November 2011 through collection of project documentation, participation in programme meetings and workshops, and by conducting interviews and convening a provider forum, as well as by analysis of electronic transactional records and of questionnaire responses. Data was analysed from CCMS transactional records (extracted for the whole operational period of 21 February 2011 to 31 October 2011) and stakeholder questionnaire responses (including patients instruments – Patient Assessment of Chronic Illness Care, the Partners in Health tool and the abridged Morisky medication adherence tool, as well as provider instrument – the Assessment of Chronic Illness tool. Interviewing and a forum involved over 40 participating stakeholders, including managers, vendors, patients and clinicians.

In this section, the evaluation methodology of NSCPP trials is described in terms of evaluation objectives, scope and setting, approach (including the evaluation philosophy and framework), as well as the study protocol.

3.1 Objectives

NSCPP implementation is being conducted in three phases – Phase 0: Exploration (March to June 2011), Phase 1: Limited Deployment (July to December 2011) and Phase 2: Wide Deployment (in planning) Jan – June 2011. The key objectives of the NSCPP evaluation study are to ascertain a detailed understanding of the following:

- Are all the components of the technical system in place to enable use including the practice systems?
- Does the system work and perform adequately according to stakeholders, to proceed to the next phase?
- What lessons on training and use of the system are essential to include in preparation for subsequent phases? How quickly do stakeholders understand the system and are able to utilise it?
- What level of support needs to be provided? For patients, primary care, specialist providers?
- What aspects did patients find useful? What is the best method for active engagement?
- What data tools and identified measures need refining?

This understanding is to be consolidated in a summary assessment against criteria (see Protocol below) and specific recommendations to NSCPP for Phase 2 as well as to inform other implementers, or potential implementers, of shared care planning solutions.

Also an integral objective of the study is dissemination of the findings. If the study changes nothing, then it should be judged a failure. In addition to informal feedback to the NSCPP Steering Group, project team members and the technical solution vendor (HSAGlobal), the

evaluation team has sent two recommendation memos and one interim report on Phase 0 status to the project team in an attempt to timely share our learning and recommendation regarding the project progression.

While the primary target of the evaluation study is for NSCPP, it is also aimed at dissemination nationally for the benefit of NZ health delivery systems. Furthermore, the results are intended to contribute to international discourse on the benefits and challenges of change in the health sector that is enabled by health IT systems.

3.2 Scope and setting

Population: ADHB: 458,336; CMDHB: 490,300; WDHB: 525,000
NSCPP Phase 0: March – June 2011; Phase 1: July – December 2011;
Phase 2: in planning
NSCPP participants: 5 DHB services; 8 general practices; 4 community
pharmacies; 73 patients

The 2006 census showed Auckland region population as over 1.3 million.²⁸ In this region, there are three DHBs – Auckland DHB (ADHB), Counties Manukau District Health Board (CMDHB) and Waitemata DHB (WDHB). ADHB serves an estimated population of 458,336 in 2011;²⁹ the estimated Counties Manukau population for 2010 was 490,300, 11.2% of the total New Zealand population,³⁰ and WDHB serves the largest DHB population in the country – more than 525,000 people.³¹ There are 13 Primary Health Organisations (PHOs) operating in the Auckland region, according to the ADHB³², CMDHB³³ and WDHB³⁴ websites.

NSCPP implementation is staged into Phase 0: Exploration (March – June 2011), Phase 1. Limited Deployment (July – December 2011) and Phase 2. Wide Deployment (in planning). By 1 November 2011, eight primary care practices have been identified and engaged to participate in the trial. Three secondary services are actively involved since July, one per DHB – ADHB: Heart Failure Service; CMDHB: Rheumatology Service (Gout); WDHB: Acute Intervention Respiratory Service (COPD). In addition, CMDHB Whitiara Diabetes Service and ADHB Diabetes Service started training and participating in NSCPP during Phase 1 implementation around September 2011. Five community pharmacist users from four community pharmacies have logged in the CCMS system; they are located in CMDHB (2) and ADHB (3) respectively. As of 31 October 2011, 73 patients are recorded by CCMS with eight patients enabled with web portal access to their record. The participating general practices are mapped to their DHBs in Table 1.

Table 1. NSCPP health provider participants

	ADHB	CMDHB	WDHB
General Practices	Grey Lynn Family Medical Centre Mt Wellington Family Medical Centre Dr De Lacey Surgery	Mangere Family Doctors Mangere Health Centre	Onewa Road Doctors Hauraki Medical Centre West harbour Medical Centre
Pharmacies	Cox's Pharmacy Elstree Pharmacy	Mangere Pharmacy Radius Pharmacy	

The implementation planning study for NSCPP¹ conducted by the technology vendor identified four work streams for the project implementation:

- Clinical and business work stream
- Ecosystem and integration work stream
- Technology and operations work stream
- Evaluation work stream

The evaluation work stream seeks to measure the successes of the trial in reaching its objectives and identify the barriers and critical success factors that would need to be addressed if and when, there are wider deployments of the approach.

3.3 Approach

Evaluation Philosophy

Evaluate the dimensions, promote the success, hear the voices and adapt the evaluation and project implementation based on the incoming data.

The philosophy of this evaluation is, in simple terms:

- To be iterative, reflective and informative – not passively evaluate following a linear design; findings from earlier iterations influences subsequent data collection, and timely feedback improves the project's opportunity for success through influencing implementation and design planning

- To evaluate many dimensions – not reducing the evaluation to a single criterion, in particular including
 - transactional data analysis – using IT system records as objective evaluation data
 - stakeholder perspectives – including taking a grounded theory approach to analysis of themes from stakeholder statements and using structured survey assessment instruments where appropriate

The complex nature of shared care and the relative paucity of robust evidence of effectiveness of shared care¹⁰ suggests that an interactive and iterative study protocol is appropriate to understand the impacts of technology-enabled shared care planning on patients, health outcomes, workforce demand, funding models or care models and health systems.^{7, 35} As such, a *participatory action research (AR) approach* is the foundation for this evaluation methodology. Participatory AR research is action, which is researched, changed and re-researched within the research process by participants. AR philosophy entails being iterative and reflective – where findings from earlier stages influence subsequent data collection approaches – providing timely feedback to improve the project’s opportunities for success, including promulgating messages about positive performance and pointing out areas for improvement.^{36, 37} Within the AR paradigm, the activities of evaluation can be unabashedly and directly integrated with efforts to improve the effectiveness of the system. Moreover, this fits the philosophy of Interaction Design,³⁸ which is the dominant paradigm for development of highly usable human-computer interfaces and most notably adhered to and demonstrated effectively by Apple Inc. Fundamental to Interaction Design is the continuous involvement cycle of users to shape the product and processes, and the additional willingness to shape the product in response to wide user feedback irrespective of the preconceptions of others (e.g. management and programmers).

In the spirit of Action Research and Interaction Design, the dissemination of findings and recommendation, early and often, and particularly back to those involved in the use and maintenance of the health IT solution, is of paramount importance.

Also highly influential to our approach is the work of Westbrooke et al,³⁹ who take a multi-method sociotechnical approach to health information systems evaluation encompassing the dimensions of work and communication patterns, organizational culture, and safety and quality. The approach is also influenced by Greenhalgh and Russell’s recommendation to supplement the traditional positivist perspective with a critical-interpretive one to achieve a robust evaluation of complex e-health systems that captures the range of stakeholder views without landing on a single point of view as the truth.⁴⁰ We see theoretical sampling⁴¹ as a natural adjunct here – i.e. drawing ideas from initial data gathering to influence further choices of sites to study and/or individuals to interviews, which requires a degree of iteration and flexibility in the evaluation project plan.

We must look critically and with a willingness to challenge the face-validity of any case that systems are delivering benefit, as well as gathering the best available objective data as evidence of system performance.

Also central to the philosophy for this evaluation is the recent review by Lau et al collating the evidence from health information system evaluations.⁴² They find that, while there is some decision evidence about health IT that can be drawn from randomised-controlled trials (RCTs), the results are not particularly consistent in many areas, and there are many gaps. This argues that we must be *sceptical* in our evaluation. Even to the extent that there is statistical evidence that health IT improves performance, health IT systems – especially as deployed into varying organisational contexts – are highly diverse. No *particular* health IT implementation is guaranteed to be delivering benefit; after all, even many of those evaluated by RCTs do not (and these are already subject to selection biases inherent in having the funding to have been part of an RCT and in publication bias toward publication of positive outcomes). Thus, we must look critically and with a willingness to challenge the face-validity of any case that these systems are delivering benefit, as well as gathering the best available objective data as evidence of system performance.

Approach: qualitative, interpretive analysis whilst seeking opportunity for objective and quantitative measurement.

While the above argues strongly for qualitative data and interpretive analysis, the fact that we are evaluating an implemented IT system provides opportunities for highly-objective and quantitative measurement as well. The transactional data laid down by the system provides descriptive measures of uptake and performance.

Framework for Assessment Criteria

The NSCPP programme stakeholders identified four main domains of interest – outcome, social, technology and economic – as the core areas with which an understanding of shared care needed to be obtained. Within these domains, some key questions have been identified that were important to answer. Accordingly, the NSCPP evaluation study was designed to measure:

1. Outcomes – What difference does it make?
2. Social – Will it work in the real world?
3. Technology – Can it work technically?
4. Economic – What are the business models that will enable uptake?

The NSCPP programme team have further identified seven sub-objectives that they have ascertained are the key areas related to a successful implementation. These have been mapped against the four higher level domains as shown in Table 2. The research team further developed qualitative and quantitative evaluation criteria for these domains, which inform the data collection protocol, notably the formulation of interview and forum questions; they also form the template for summary assessment of the implementation.

Table 2. Domains of interest for NSCPP evaluation.

#	Domain	NSCPP Objectives	Evaluation Criteria
1	Health Outcomes	Support pilot patients in managing their conditions. In the event of a patient presenting at ED, clearly and comprehensively inform ED staff regarding a patient's care plan and treatment. Reduce patient's waiting time to treatment due to delays whilst information is sourced.	What worked well, success factors, what would you do differently? Benefits? Who doesn't use and why? Realised, unrealised, unexpected, flow on effects
2	Social	Collaborative development of the care plan with all members of the care team and the patient. Better inform treating clinicians by providing quicker / easier access to consultation records.	Improvements, efficiencies, visibility, access to care, clinician and patient knowledge, change of practice, patient access to care, safety, efficiency, roles, changes, relationships
3	Technology	Provide a more efficient means for requesting (non-referred) services from other care team members.	Data, messaging, interoperability, scalable, replicable transmission, monitoring, reporting, patient confidentiality
4	Economic	Provide a more efficient means for requesting (non-referred) services from other care team members.	Time, money, resource

Figure 2 maps out the programme logic for these domains and the elements that form and guide the evaluation process.

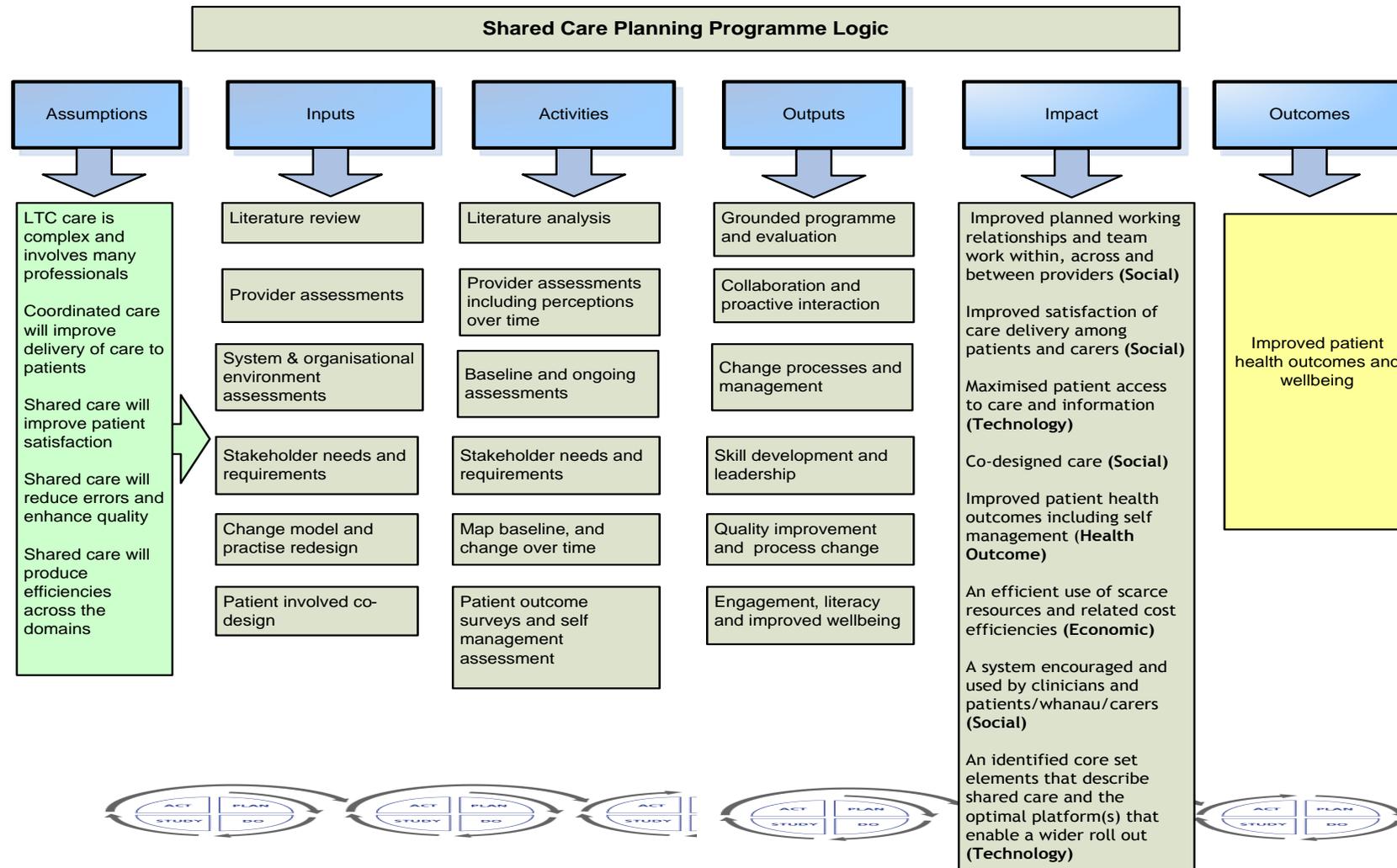


Figure 2. Programme Logic Model

Compliance to Health IT Evaluation Framework

The NSCPP evaluation has applied a general framework for Health IT Evaluation that was developed by NIHI.² The methodology of the evaluation activities, and its reporting (e.g. as per the present document), is intended to be illustrative of the Framework's recommended approach.

In the next section we set out the Protocol for evaluation that implements the Approach described above.

3.4 Protocol

The protocol for evaluation study of NSCPP was approved by the Northern Y Regional Ethics Committee, approval NTY/11/06/058.

A mixed method (qualitative and quantitative data), multi-measure approach to data collection has been used. The tools used are also mixed modal to enable as rich a picture as possible with which a depth of understanding can be developed. As such, in addition to participating in as many of the programme implementation forums and planning discussions, stakeholder interviews, a provider forum, clinician and patient surveys, document review including shared plan system audit reports and transactional data analysis have been used to understand the status of NSCPP to date and to inform the development of Phase 2.

Evaluation Domains and Measurement Criteria

Benefits; Improvements, Roles; Data, Messaging; Time, Resource

The domains of interest as per Table 2, underpin the approach to measurement of the NSCPP implementation. These were taken fairly literally in establishing a baseline set of stakeholder interview questions such that qualitative data (stakeholder views) would be collected as relevant to the domains. Moreover, the breadth of the domains indicated a wide initial selection of stakeholders to interview, including clinical, management, IT and patients.

Issues within the four domains were expected from the outset to be amenable to development of compelling information from interviews, particularly:

- Benefits? Who doesn't use and why? Realised, unrealised, unexpected, flow on effects
- Improvements, efficiencies, visibility, access to care, clinician and patient knowledge, change of practice, patient access to care, safety, efficiency, roles, changes, relationships
- Data, messaging, interoperability, scalable, replicable
- Time, money, resource implications and future funding models

Thematic analysis is reported in the results section with respect to these issues and others that emerged during the formal interview process and is described under the four dominant themes of outcome, social, technology and economic.

User acceptance, workflow and communications

Transactional analysis allowed several specific measurements of relevance to the evaluation domains:

- User acceptance – we assess the volume of use of CCMS system as evidence of usability being sufficient to overcome barriers to acceptance
- Workflow – we look at activities tracked in CCMS records for indications of the workflows supported by the tool
- Communications and information sharing – we look at the content of care plans, notes, tasks and messages for insight into transformations in process and the communications linkage of primary and secondary physicians.

Data Collection Protocol

Review of key project documentation, meeting participation, interviews, provider forum, questionnaires and data extraction

Table 3 summarises the evaluation data sources.

Table 3. NSCPP evaluation data collection plan

Data Source	Qualitative Data	Quantitative Data
Project Documentation and emails forwarded by the programme team to evaluation team	Project design and approach documents Meeting agenda and minutes Project status reports Technology and practice coaching related discussion papers Weekly CCMS audit reports Media releases Email communications among the team/users	

Data Source	Qualitative Data	Quantitative Data
Meeting participation by evaluation team	Evaluators' notes	
Interviews and forum conducted by evaluation team	Audio tapes Evaluators' notes	
Patient questionnaire responses		Scores to the standard instruments: PACIC PIH Morisky
Provider questionnaire responses		Scores to the standard instrument: ACIC
CCMS	Content of Notes Content of Tasks Content of Plans Content of Messages	Diagnosis count Medication count Notes Tasks Plans Messages Audit log

Key project documents produced by the NSCPP project management team and the technology vendor include project design and approach documents, numerous meeting agendas and minutes, project status reports, technology and practice coaching related discussion papers, weekly CCMS audit and usage reports, media releases including routine newsletters and email communications. Ongoing review of these communications among the team/users has assisted understanding of the progression of the programme. This was accompanied by the evaluation team's attendance and participation at many of the project team meetings, workshops, user forums and consumer forums, as well as steering group meetings where observation and feedback have been provided by the evaluation team.

Stakeholder perspectives were collected through individual and group interviews and a provider forum where all health care provider participants were invited to share their experiences with each other. Evaluation interviews were conducted with both patients and clinicians, with the latter sometimes in small group sessions. All participants were given a Participation Information Sheet and signed an Informed Consent form, in accordance with the ethics protocol. Interviews and the forum were audio-recorded and were structured around a set of guiding questions regarding the four domains (see Appendix B: Schedule of interview questions). The audio tapes and evaluators' notes were reviewed collectively by the authors to extract major themes and supporting direct quotes.

Patient and provider questionnaire surveys: Baseline

In recognition that understanding patient's experiences of the health system and the care received is crucial to understanding where improvements can be made, the patient questionnaire data collection tools used are the validated Patient Assessment of Chronic Illness Care (PACIC)⁴³, the Partners in Health (PIH) tool⁴⁴ and the Morisky (abridged) medication adherence tool⁴⁵. (See also Appendix C: Patient Questionnaire Instruments – PACIC, PIH and Morisky) The PACIC and PIH tool are validated instruments in the implementation of Wagner's Chronic Care Model¹⁹; and the Morisky is a validated tool for measuring medication adherence and change over time. These tools are to capture quality, along with safety, promptness, effectiveness, efficiency and equity. Patient centeredness may be a first principle that can provide a lens to focus action, and as such can be used to support and meet these aims. The PACIC, PIH and Morisky were combined in this evaluation to form a single questionnaire of 3 pages in length. Some of the word usage was changed to match New Zealand health environment. The PIH scale has been reduced from 8 to 5 and the 'poor' to 'very good' order reversed to match the other questionnaire scales and scoring criteria of the other two forms, but no changes were made to the substance or intent of the questions. These were tested on two Phase 0 patient participants, both with English as a second language, and no problems were highlighted with answering the questions. This survey has been collected as patient participants were being enrolled. Patients were encouraged to self-complete the forms, but were offered the opportunity for it to take the forms of an interview by a member of the evaluation team if they felt they needed assistance. In the majority of cases the questionnaire has been self-completed; and in two other cases it has been led by an interviewer from the evaluation team.

For health professionals, the Assessment of Chronic Illness (ACIC)⁴⁶ is a survey tool designed to help practices to move toward a more co design and patient oriented approach in managing chronic illness. (See also Appendix D: Provider Questionnaire Instrument - ACIC) Changes were made to the language and formatting to facilitate both useability and relevance to New Zealand. These have been given to the health professionals in both primary and specialist services to complete. The intent of the tool is to use the results to generate areas identified for improvement. It will assist in establishing a baseline on current practice and with understanding how shared care is responsive to changes teams make in their systems to support the six elements of effective chronic care management: community resources, health organization, self-management support, delivery system design, decision support and clinical information systems.

The original intent was to administer the patient and provider questionnaires twice in Phase 1, as a baseline as well as subsequently, thus allowing an assessment of change as shared care planning progressed. A repeat administration of the questionnaires was deemed unfruitful, however, because of: (a) the short duration of engagement for most patients, and (b) limited organisational penetration of SCP for most participating provider facilities. With respect to the former, with ongoing enrolment, few patients had experienced a full three months of shared care since baseline questionnaire completion. Since much long-term condition management activity in New Zealand is based on quarterly routine general practice appointments, the timeframe was simply too short to expect the majority of patients to have perceived a change

in their care. With respect to the latter issue, ACIC is a questionnaire about organisations, and Phase 1 shared care only involves a small percentage of patients and providers in the participating organisations. Thus it has not provided sufficient breadth of interaction to have penetrated and transformed the organisational practices in a way that could be expected to impact the ACIC score. We are recommending that the surveyed patient and provider cohorts be re-surveyed at the end of Phase 2 whereupon more shared care exposure will have been achieved and thus a detectable difference will be more likely.

Transactional analysis: CCMS usage data

Data extraction opportunities and procedures were reviewed and agreed with the technology vendor. Extracts of transactional data from CCMS were created by HSAGlobal. Patient confidentiality was protected by encryption and password protection of the extract files. Evaluation team analysts also signed DHB non-disclosure agreements.

CCMS data includes diagnosis count, medication count, notes, tasks, plans, messages and audit log entries. The data was extracted for the period in which CCMS became operational (21 February 2011) through to 31 October 2011. Most of these data items include indications of the user that has created and/or modified the data, allowing tracking of activity by roles (specialist physician, practice nurse, etc.). The next section summarises analysis approaches taken.

Analysis and Reporting

Transactional data analysis, baseline questionnaire results, interview themes, recommendation and dissemination

Transactional data were analysed to assess rate and pattern of use of the shared care planning technology solution (CCMS). The extract of data fields from CCMS was analysed in Microsoft Excel. Transaction record volumes were assessed by role and over time. To achieve a richer picture of how CCMS was employed for specific cases software engineering modelling technique, unified modeling language (UML) activity diagrams with swimlanes⁴⁷, were used to model the workflows for a selection of patient cases (one from the Exploratory phase, and one from each DHB in Phase 1). Further insight was sought by looking at the content of care plans and communication messages, including notes and tasks.

Patient and provider scores in baseline questionnaire surveys were interpreted according to the literature.

Key points from reviewed documents, meetings attended and interviews conducted, as well as the forum, were abstracted from audio log and notes by the evaluation team. Iterative reflection on these data (both individual and through the routine meetings of the interview team) informed formal and informal feedback to the Steering Group and project team, and

guided subsequent choices of interviewees. The analysis informs assessment against the four framework domains of interest – outcome, social, technology and economic – and forms the basis for recommendation as the programme moves to Phase 2.

The present report will be made available through the HIVE (<http://www.hive.org.nz>). Aspects of the findings will also be prepared for academic peer review and publication (subject to acceptance in the peer review process).

4 Results

4.1 Data collected

Evaluation data was gathered between March and November 2011 implementing the study protocol defined in previous section. Table 4 summarises the data collected.

Table 4. NSCPP evaluation collected data

Data Source	Qualitative Data	Quantitative Data
Project Documentation	Project design and approach documents (32) Meeting agenda and minutes (59) Project status reports (42) Technology and practice coaching related discussion papers (16) Weekly CCMS audit reports (58) Media releases (7) Email communications among the team/users (53)	
Meeting participation	Evaluators' notes (39)	
Interviews and forum	Audio tapes (21) Evaluators' notes (27)	
Patient questionnaire		PACIC (53) PIH (53) Morisky (52)
Provider questionnaire		ACIC (23 individuals from nine organisations)
CCMS	Content of Notes (91 entries) Content of Tasks (371 entries) Content of Plan Elements (549 entries) Content of Messages (78 entries)	Diagnosis counts per patient Medication counts per patient Notes Tasks Plan Elements Messages Audit log (21,922 entries)

4.2 Description of the solution deployed

<i>8 General Practices</i>	<i>5 Secondary Services</i>
<i>4 Community Pharmacies</i>	<i>73 Patients</i>

The technology solution of NSCPP, HSAGlobal's CCMS (Collaborative Care Management Solution), is a web-based clinical case management solution. Key functions CCMS offers include:

- Accessing patient records
- Creating and reviewing patient care plans
- Communicating with patient and patient's care team members

The patient records shared among care team members include diagnoses, measurement results, medications, notes, care plans, and record summary. To facilitate collaborative and linked care planning activities, CCMS provides multi-level plan templates and communication support through notes in the patient record, task assignments (to self or other users) and messages between users. Note that in the NSCPP context the message function was disabled in late August due to confusion regarding multiple inter-provider communication pathways. Patients as well as providers can be registered as users, although patients have more limited access privileges (viewing their records and care plans rather than changing them; also patient users cannot, in the current version, assign tasks to their care team or send messages through CCMS to care givers). A user can be added to the care team for any given patient, although any user can 'break the glass' to access a patient's records, for instance in the ED scenario to look up the summary page.

CCMS has achieved a degree of interoperability with:

- General practice PMS (practice management system) software: MyPractice (Phase 0) and MedTech 32 (Phase 1)
- Secondary clinical information systems: Orion Concerto (Phase 1)

The message based integration between CCMS and the PMS supports full bi-directional dynamic integration with MyPractice and user driven manual integration with MedTech 32.⁴⁸ Along the course of NSCPP implementation, experience was gathered through negotiating with the various technology vendors and in testing/tuning the data and process interoperability in the operational contexts of the participating providers. While iterative refinement was (as intended) most active during and immediately following Phase 0, extension and modification of the inter-system data exchange mechanisms has continued throughout Phase 1.

User feedback has driven revision and refinement of the CCMS user interface, most actively (as intended) in Phase 0, and continuing in Phase 1. Phase 0 user feedback was particularly formative and constructive in arriving at the CCMS view for general practice as seen within the

MyPractice PMS, notably in tuning the presentation of CCMS-based updates from other care team members and in synchronisation of patient context between the CCMS content and the MyPractice display in which it is 'framed'. General practice users can also access CCMS as a browser based application, as do other users, which is a better fit to workflow for some tasks (particularly those undertaken by the practice nurse as opposed to the GP), Non-care team users in the hospital setting can access CCMS content via Concerto as a PDF summary.

Training for using CCMS was delivered to participating providers by either the technology vendor (HSAGlobal) or the healthAlliance support team. Appendix E. CCMS NSCP Quick Guide Produced by HSAGlobal is one of the key training materials. This guide focuses on the key use cases, including accessing an enrolled patient record in CCMS (e.g. using 'patient search' button under the 'home' tab after log-in), notifications and communication. Tasks can be created from multiple pages including the 'home' page, 'patient medications' page and 'patient care plan' page. The guide also covers shared care plan creation and review (using available plans templates), care delivery and review (via 'this encounter' and 'recent activity' tabs on the 'patient overview' page) and ending an enrolment (from the 'patients' tab). The reader is referred to this appendix for CCMS user interface details.

4.3 Transactional data analysis

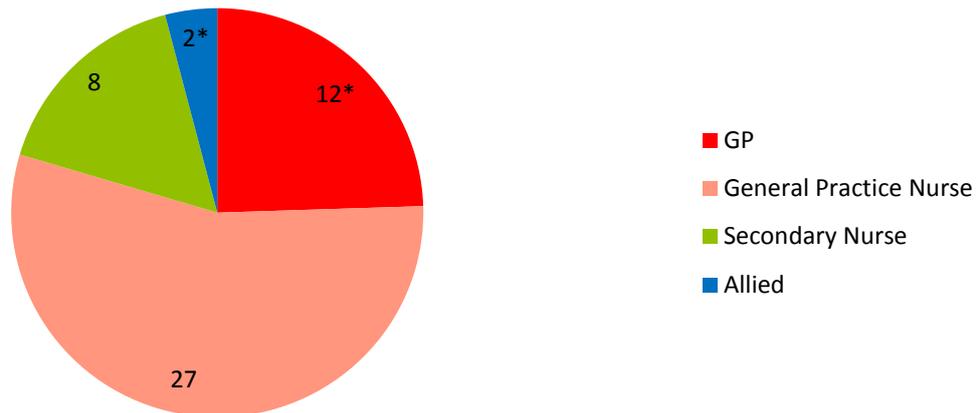
As of 31 October 2011 activities from eight general practices and five secondary services regarding 73 patients have been recorded in CCMS, as shown in Table 5.

Table 5. NSCPP participants

DHB	General Practices	# of Patients Enrolled	# of Patients with Care Plans	# of Patients with Portals
ADHB	Grey Lynn Family Medical Centre	18	11	1
	Mt Wellington Family Medical Centre	2	1	0
	Dr De Lacey Surgery	5	2	0
CMDHB	Mangere Family Doctors	22	16	7
	Mangere Health Centre	4	4	0
WDHB	Onewa Road Doctors	5	3	0
	Hauraki Medical Centre	11	8	0
	West harbour Medical Centre	6	3	0
Total:		73	48	8

Activity Distributions by Role and Time

Figure 3 and Figure 4 summarise the authoring of patients’ care plans and detailed plan elements respectively. They demonstrate that a full range of provider roles are contributing to patient plans. The majority of contributions are by the General Practice Nurse. Further to this, one can say that about three-quarters of the care plan contribution (initiating the plan, or adding elements) is from nurses, or equally, from general practice.



* One GP and one physiotherapist were working on developing care plans for the same patient.

Figure 3. Authors of Care Plans

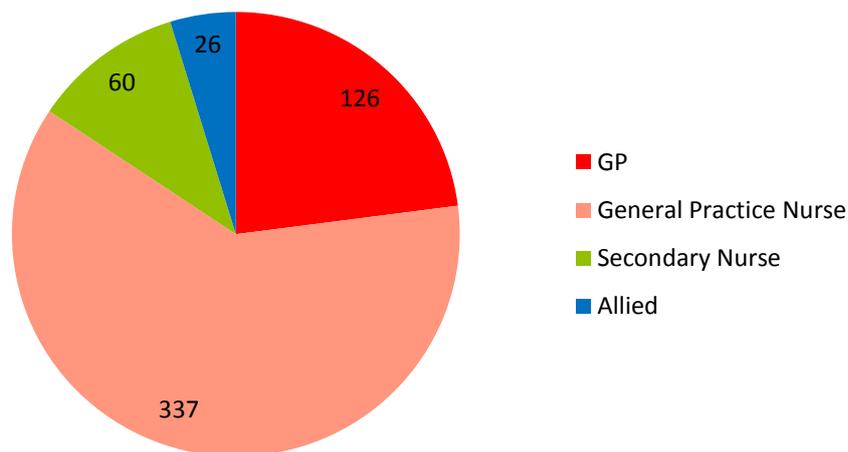


Figure 4. Authors of Care Plan Elements

Figure 5 shows the number of plan elements in each patient’s care plan ranging from 3 to 29. The x axis shows the number of care plan elements in a given plan; the heights of the bars (y-axis values) are the counts of the number of occurrences of care plans with that many

elements. The median number of care plan elements is 11 (inter-quartile range 8 – 14). In interpreting these quantities, however, we must be careful to consider that many of the elements are in fact fragments of care plan templates (see content analysis, Table 14); this may also represent some bias for the distribution of items created by role (Figure 6).

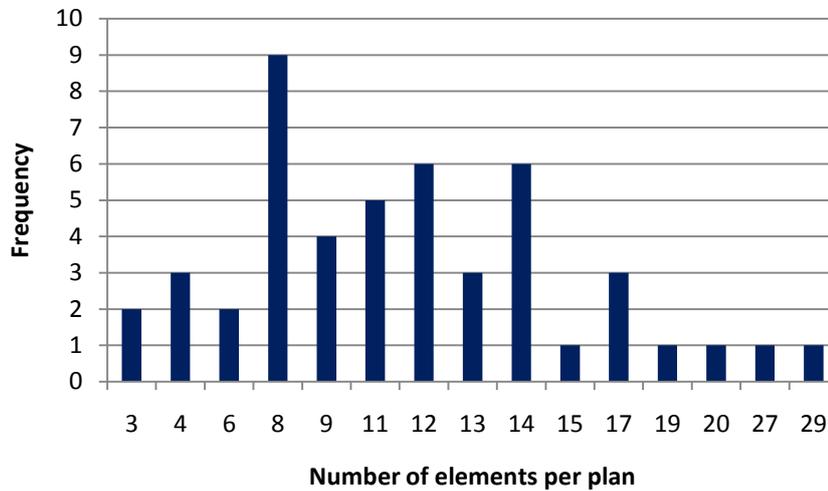


Figure 5. Histogram of number of plan elements per patient care plan

Figure 6 captures the provider/patient activities of creating and modifying notes, plans, messages and tasks, by month and according to their roles.

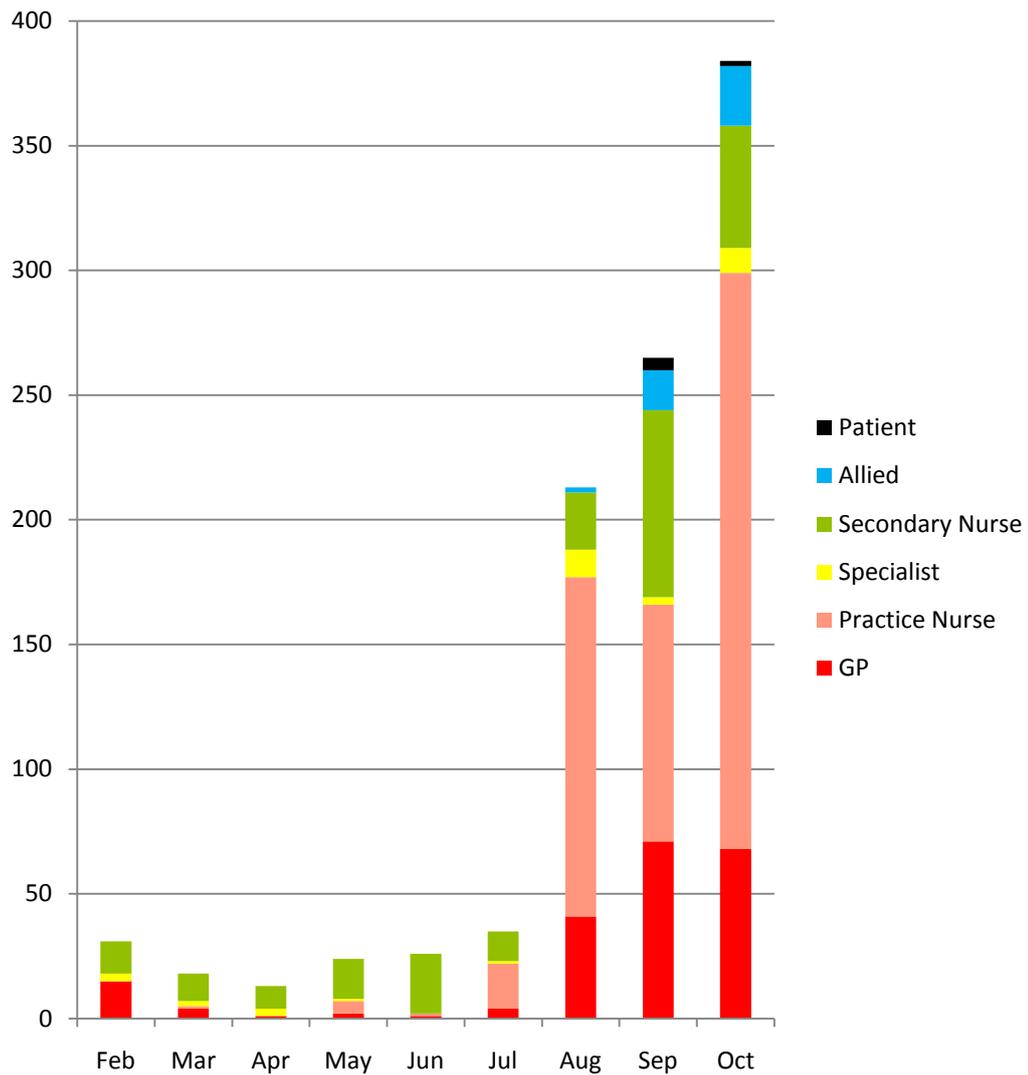


Figure 6. Sum of entries created or modified (over notes, care plan elements, messages and tasks) by role

Figure 7 captures the provider and patient activities of viewing diagnosis, measurement results, medication, notes, plans, record summary, messages and tasks, by month and according to their roles. Note that the data for Figure 7 comes from the CCMS audit log. This log is intended to support medico-legal accountability and was not optimised to function as a tool for usage measurement. The log may be counter-intuitive as to just what elements displaying to the user screen generate a log entry, or multiple log entries (e.g. see entries in Table 6 that indicate multiple task list views as consecutive user actions in consecutive minutes). We believe, however, that the log can give a reasonable indication of the overall relative levels of CCMS viewing among user roles.

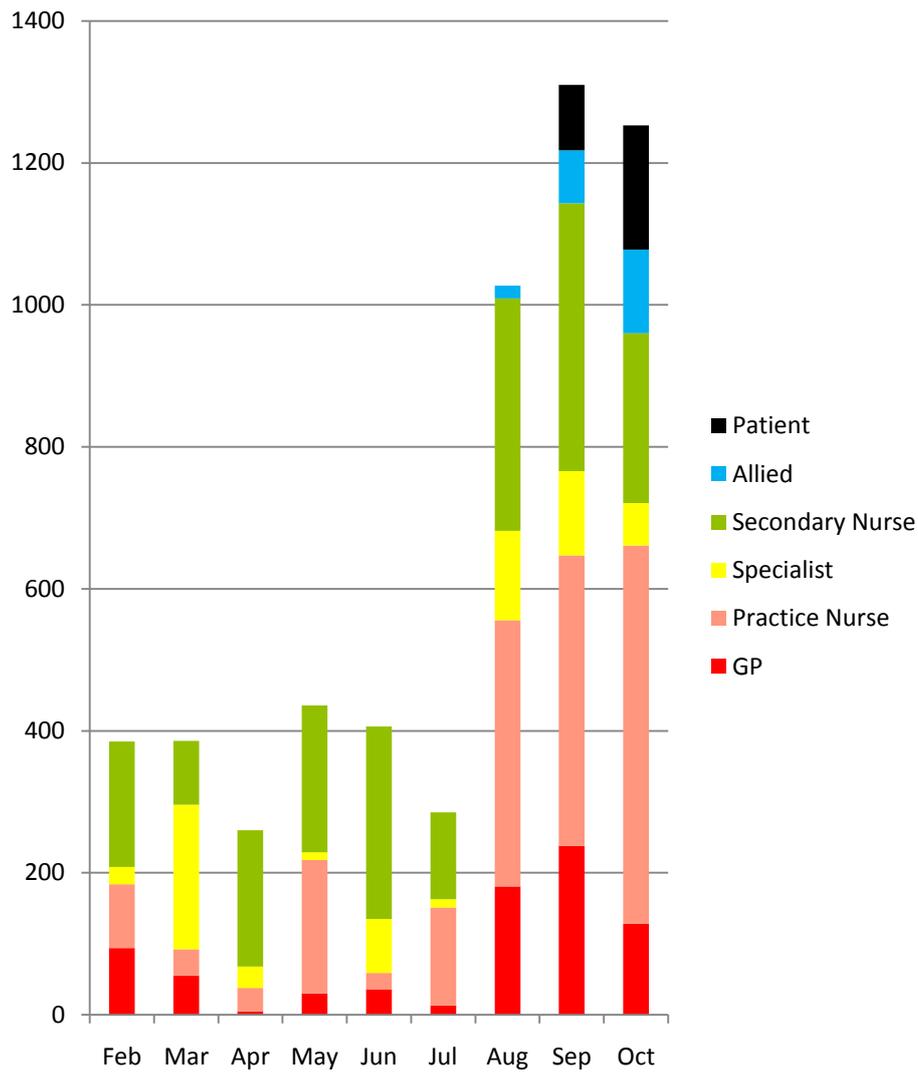


Figure 7. Elements viewed by user role based on number of CCMS audit log entries

Table 6. An example of CCMS audit log entries indicating consecutive views of the same user interface element

Record Type	Action	Logged	Primary Record ID	Record ID	Additional Info
Tasks	Viewed	2011-07-29 17:18	1	0	Task list viewed
Tasks	Viewed	2011-07-29 17:19	1	0	Task list viewed
Tasks	Viewed	2011-07-29 17:20	1	0	Task list viewed

A number of observations can be made on the data in Figure 6 and Figure 7:

- As expected, we see the great scale-up in activity as Phase 1 takes hold (starting in earnest in August)

- We see the emergence of patient and allied users from August to October, with steady growth in allied activity and patient viewing
- The role of specialist physicians as direct users, particularly with respect to element creation/modification, is quite small
- The role of nurses is dominant for viewing and creation/modification on all time periods except for a few cases in the early Exploratory Phase in February
- In Phase 1, the role of general practice in element creation is highly dominant (at least two-third of entries), but is more balanced by other user roles (roughly 50% of total activity) with respect to viewing.

Note that element creation/modification as per Figure 6 includes marking a task as completed (which is the only such action available to patients in the Phase 1 portal).

Communication Patterns

Table 7, Table 8, Table 9 and Table 10 present the communication patterns in CCMS among health care providers for four patient cases. The patterns are presented as 'swimlanes' with entries under each role and proceeding forward in time as one reads down the page. The activities recorded in these swimlanes are creation (or modification, for elements where the concept applies) of messages, tasks, patient notes and plan elements. Case Ho is a heart failure patient following through both the Exploratory Phase and Phase 1. The three other cases – H1, R1 and C1 – are Phase 1 enrollees in the heart failure, rheumatology (i.e. gout) and COPD (chronic obstructive pulmonary disease; i.e., airways or respiratory) pilots, respectively.

Table 7. Provider communication for health failure patient Ho from Feb-Oct 2011 (since Exploratory Phase)

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-04-15			Assigns Task#1 to Specialist (arrange echo, Due date: 12/05)	
2011-04-15			Creates Clinical-Management Note (home visit today. plan to review in GLCC Wed 20th for ECG. Consented and signed re shared care plan.)	
2011-04-18			Sends Message#1 to GP, GP Nurse and Specialist (home visit: Hi all, I did home visit on [Ho]. [Ho] is stable. I plan to review [Ho] in clinic on Wed am with ECG. Heart rate either AF or VPB's. [Ho] is going [away] again in early May so would like to have ECHO prior to this)	
2011-04-20			Assigns Task#2 to Herself (to read [condition] booklet and understand symptoms, monitoring, and recognising when not well, Due date: 27/04)	
2011-04-20			Sends Message#2 to GP, GP Nurse and Specialist (increase beta blocker and reduce frusemide: Hi, I reviewed [Ho] this am. ECG SR with ectopy. I have increase metoprolol to 47.5mgs and decreased frusemide to 40mgs. Plan is to have ECHO and review with Specialist re restarting ace inhibitor)	
2011-05-02			Creates Clinical-Management Note (I started [Ho] on Cilazapril 1.25mgs daily on 27th April. [Ho] has form to do U&E's next week. We had arranged echo for mid May but [Ho] going [on holiday]. I plan to follow [Ho] 2 weeks for further drug titration)	
2011-05-02	Sends Message#3 to Secondary Nurse and Specialist (Defer echo as [Ho] is off [on holiday] for 2 weeks)			

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-05-02		Assigns Task#3 to Secondary Nurse (Impact of illness, no Due date)		
2011-05-03			Sends Message#4 to GP Nurse (Hi, Can you please arrange to review [Ho] and check BP also get [Ho] to have U&E this week if you can please? Thanks)	
2011-05-11			Sends Message#5 to GP and GP Nurse (increase beta blocker: I have increased metoprolol CR to 71.25mgs. I note renal function increased since restarting ace inhibitor will check renal function today and cc copy to practice. otherwise well)	
2011-05-11				Marks Task#1 as completed
2011-05-13		Replies Message#5 to Secondary Nurse (Got your message - Did try to get hold of [Ho] to do a BP - but no reply x3)		
2011-06-16	Creates Clinical-Management Note (Started on low dose nortriptyline at night as significant pain anxiety Sx Cellulitis has resolved.)			

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-06-29			Creates Clinical-Management Note (seen in clinic today. main complaint is increasing SOB, ECG SR rate 85 with VPB's and LBBB. on examination JVP mid neck, Chest dull left base and rifght lung clear, minimal leg oedema, weight 92.1 down from previous clinic visit. [Ho] appears to have lost muscle mass and I have changed [Ho's] weight range to 88-90kgs. I have also restarted Frusemide frusemide 40mg and will follow [Ho] up by phone on Friday. Remains on 1.5L fluid)	
2011-07-14	Sends Message#6 to Secondary Nurse (renal impaired: I have advised stop frusemide as creat incr and wt 87kg. bp 96/60)			
2011-07-20			Creates Clinical-Management Note (reviewed in clinic. Note renal function deteriorated and frusemide stopped. Renal function improved. Weight stable and [Ho] feeling good. I have increased [Ho's] betaloc to 95mgs ([Ho] still has 23.75mg tabs and will use these up first) Will need script for 95mg strength at next GP review. Also suggest decrease allopurinol to 150mg to help improve renal function and enable us to further titrate ace inhibitor. GP to review ar next appointment.)	
2011-07-20			Sends Message#7 to GP (Hi. I have increase betaloc to 95mgs today, [Ho] still finishing [Ho's] 23.75mg strength, [Ho] knows to take 4 tabs. [Ho] will need new 95mg strength at next review. Could we consider reducing allopurinol to 150mg to help renal function and enable us to uptitrate cilazapril?)	
2011-07-20			Sends Message#8 to GP and GP Nurse (Repeat renal function: I have asked [Ho] to repeat renal function in 2weeks, cc'd a copy to you, can you review)	

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-07-22		Replies Message#8 to Secondary Nurse (No problem)		
2011-08-02	Sends Message#9 to Secondary Nurse (renal and meds: Renal is much improved, [Ho] will slowly incr allopurinol to 300mg I have given a few prednisone to take in case of gout attack, Now on 190mg betaloc)			
2011-08-03			Creates Copy-sent-to-GP Note (stable, have given script for metoprolol 95mgs as discussed with GP. I have increased metoprolol to 142.5mgs. will review 2 weeks)	
2011-08-03			Creates Review-type Plan: Problem: to continue long term management of [condition]; Goal: stay well and look after family; Action: to continue to take medications, monitor weight, reduce salt intake and be mindful of fluid intake; Notes: weight without excess fluid 88-90 kgs	
2011-08-05			Creates Copy-sent-to-GP Note (measurements for 3rd August BP153/92 HR 75 and weight 90kgs)	
2011-08-10			Marks Task#2 as completed	

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-08-17			Creates Copy-sent-to-GP Note (well. Able to titrate betaloc to 190mgs. creatinine today. [GP] can you check and I have asked [Ho] to make appointment to see you next week. If creatinine stable can you increase cilazapril to 5mgs, with repeat creatinine in one week following increase. Specialist to review following ECHO next month)	
2011-08-17			Assigns Task#4 to GP (check renal function: if renal function stable, increase cilazapril to 5mgs with repeat renal function for one week later, Due date: 24/08)	
2011-08-17			Assigns Task#5 to General Practice Nurse (follow up bloods and repeat bloods: Can you check [Ho] renal function and if stable get [Ho] to see GP and have cilazapril increased to 5mgs if BP ok. Please recheck [Ho's] renal function one week following increase of cilazapril. Specialist will review following ECHO in Sept, Due date: 24/08)	
2011-08-22		Modifies Task#5		
2011-08-23	Sends Message#10 to Secondary Nurse (renal fn and HR - on 95mg betaloc: i think [Ho] should stay on 95mg betaloc - renal function improved considerably and HR is fairly bradycardic,)			
2011-08-25			Sends Message#11 to GP and GP Nurse (bloods: Hi, [Ho] is on holiday , will be back next week, so bloods can wait)	
2011-08-26	Marks Task#4 as completed			
2011-08-29		Modifies Task#5		
2011-09-05		Marks Task#5 as completed		

Table 8. Provider communication for health failure patient H1 from September to October 2011 (Phase 1)

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-09-20	Assigns Task#1 to Secondary Nurse (new pt needs home visit - just started warfarin and frusemide, poor english daughter translates: Awaiting cardioversion, no Due Date)			
2011-09-20	Creates 'CHF on warfarin' Plan: Problem: Breathlessness Goal: be able to walk without being breathless Action: Weigh daily and recognise if weight going up it means I am holding on to fluid and I need to contact GP/ Nurse or HF nurse			
2011-09-26			Marks Task#1 as completed	
2011-09-26			Creates Copy-sent-to-GP Note (home visit 23rd Sept. Both legs mild oedema, chest bibasal crackles mid sone down. troublesome cough. weight 139.5 increased frusemide to 80mgs daily and tel call today Mon 26th Sept weight down 136.6 and cough less. patient due Holter on 13th Oct. Plan to review in cardiology clinic on Wed 28th)	
2011-09-28			Creates Copy-sent-to-GP Note (clinic visit. ECG SR 65 Much improved. Nil SOB, walking better and longer, no dizziness like before. Chest-still bibasal crackles but less than last week Continue on 8ofrusemide. have given form to check renal function with INR next weekcan you review)	
2011-10-06			Assigns Task#2 to Patient (Weigh daily and recognise if weight going up it means I am holding on to fluid and I need to contact GP/ Nurse or HF nurse, no Due Date)	

Table 9. Provider communication for rheumatology patient R1 from July to October 2011 (Phase 1)

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-08-24		Assigns Task#1 to Specialist (general gout review, Due Date: 25/08)		
2011-08-30		Modifies Task#1 of Due Date to 07/09		
2011-08-30				Marks Task#1 as completed
2011-08-31				Creates Copy-sent-to-GP Note (His creatinine is rising 228 umol/L (30/7)so despite good urate control at 0.37 mmol/L the safest option is to reduce his allopurinol to 200 mg daily, repeat serum creatinine urate and CRP and consider phone call to renal physicians. Is his BP controlled?)
2011-09-02		Assigns Task#2 to Specialist (clinical advice recieved - many thanks, Due Date: 06/09)		
2011-09-06		Modifies Task#2		
2011-09-06		Assigns Task#3 to herself (clinical review by Specialist -in Recent Activites: Hi [GP] – [Specialist] has replied to a task I sent him - to do a clinical review of his gout, you can see this in the pt's care plan , under Recent Activites, and again in Notes. Due Date: 07/09)		
2011-09-06		Modifies Task#3 to assign to GP		
2011-09-09				Modifies Task#3 as completed
2011-09-09				Assigns Task#4 to General Practice Nurse (Allopurinol dose reduction: Has dose reduction of allopurinol occurred? Due Date: 14/09)

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-09-09				Assigns Task#5 to General Practice Nurse (Repeat blood tests: Has creatinine, CRP and uric acid been repeated in view of elevated cretainne at last assessment? Due Date: 12/09)
2011-09-12				Marks Task#2 as completed
2011-09-16		Modifies Task#4 Marks Task#5 as completed		
2011-09-19		Marks Task#4 as completed		
2011-09-29		Assigns Task#6 to Specialist (change allopurinol dose on meds list: Hi – this man’s GP has had problems logging into e shared care – now sorted, I meet with him mane to 47e- establish his log on with e shared care and to change the dose of ALP on meds list, I have tasked the pt and the GP letting them know that this will be happening mane. Due Date: 04/10)		
2011-09-29		Assigns Task#7 to GP (change allopurinol dose on meds list: Hi - I am meeting with you mane to go over logging on and to change this man's allopurinol dose in his meds list, I have let Specialist and the Pt. know we are doing this, Due Date: 04/10)		
2011-09-29		Assigns Task#8 to Patient (Hi - the specialist suggested a chnage in the dose of your allopurinol from 300 mg down to 200 mg a day, your Gp will chnage this on your meds list for you, Due Date: 04/10)		
2011-09-29		Creates Copy-sent-to-GP Note (Rang pt – asked if he had received message to reduce allopurinol from 300 mg down to 200 mg a day – left msg on his answer phone and I will call him again to make sure he knows.Tasked myself to ring him again)		

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-10-04				Creates Copy-sent-to-GP Note (Allopurinol reduction to 200 mg noted .Requires blood test for creatinine and urate)
2011-10-04				Marks Task#6 as completed
2011-10-05		Marks Task#7 as completed		

Table 10. Provider communication for COPD patient C1 from July to October 2011 (Phase 1)

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-09-15		Creates Copy-sent-to-GP Note (concerned about chest today. increased use of ventolin in last week. auscultation slight crack base of right lung po2 96% pulse 77. peak flow 300)		
2011-09-15		<p>Creates COPD Action Plan:</p> <p>My main priority is.</p> <p>Symptoms I would like help with and their impact on my health.</p> <p>Problem: COPD; Notes: refer for Pulmonary rehab.</p> <p>My clinical targets and response to early warning signs.</p> <p>Problem: activate action plan if needed; Notes: to monitor symptom and activate action plan if required given plan today.</p> <p>Lifestyle factors and self-management skills I need to work on include.</p> <p>Problem: COPD; Notes: to manage breathless symptoms at home small amounts of house work daily look at help with this as things are becoming mor difficult plan activities and avoid rushing.</p> <p>My main priority is; Notes: to maintain good health with COPd</p>		
2011-09-15		Assigns Task#1 to herself (Pulmonary Rehab: Refer for Pulmonary Rehab, Due date: 12/10)		

Date	GP	General Practice Nurse	Secondary Nurse	Specialist
2011-09-16		Assigns Task#2 to Secondary Nurse (Pulmonary Rehab: please could you assess [Patient] for Puylmonary rehab. She is noticing lately an increase in sob on routine house hold activities. As part of a Auckland university study last year she was started on tritropium and post start her fev1 was 65% of predicted, Due date: 27/09)		
2011-09-28			Marks Task#2 as completed	
2011-09-28			Creates Phone-call Note (have contacted Patient and discussed pulmonary rehab and what it entails - have referred her to pul rehab she should hear back from physio outpatients within a month)	
2011-10-06		Modifies Task#1 to assign to Secondary Nurse		
2011-10-06			Marks Task#1 as completed	

A number of observations on the communication patterns are noteworthy:

- The data illustrate rich and meaningful communications across the primary-secondary boundary to coordinate care. All four major roles (nurses and physicians in the two settings) communicate with each other, and we can particularly see coordination between the physician in one setting and the nurse in the other.
- The Message feature appeared to be popular but was discontinued in late August to simplifying the available interaction options for users. Indeed we can see considerable redundancy of Notes and Message content (e.g. see Ho on 20 July). The 'Copy-sent-to-GP' type of Note appears to provide a surrogate for the cases where a user would otherwise be tempted to redundant data entry.
- As the trial progresses, the use as Tasks appears to be effective and is embraced by all four roles; we also see assignment of tasks to patients.

Removal of the Message feature is not necessarily a solution to redundancy issues. In Table 9, the general practice nurse assigns three tasks to specialist, GP and patient respectively regarding medication dose change on 29 September; and also created a Copy-sent-to-GP note recording this action.

The next section examines the content of communications across a large sample of the Phase 1 CCMS data.

Textual Content Analysis

The content of textual communications amongst care team members through the CCMS record has been analysed. Textual elements analysed are:

- Notes
- Task descriptions (label and associated textual details), and
- Care plan elements (label and notes).

To focus on user communications after the Exploratory Phase and the earliest start-up period of Phase 1, the analysis is based on all text in the above fields for 1 August 2011 to 31 October 2011. Messages were discontinued in August and thus are considered only briefly.

Notes. The notes field provides a general mechanism for adding text to the CCMS record. A note can, however, be indicated by the author as type 'Copy sent to GP'. Of the 91 notes entries created in the CCMS database as of 31 October 2011, 64 were created 1 August or later and 50 of these (78.13%) are of type 'Copy sent to GP'. These 64 notes recorded in CCMS from 1 August 2011 to 31 October 2011, were written by 20 individual users, including three GPs, five specialists, five general practice nurses, seven secondary nurses, two pharmacists and one physiotherapist. As per Figure 8, note authorship is skewed towards a few users. One user (a secondary nurse) created 20 (31.25%) of the notes, followed by one primary nurse who created 8 notes (12.5%); 65.6% of all notes were authored by six users (two secondary nurses, three general practice nurses and one specialist).

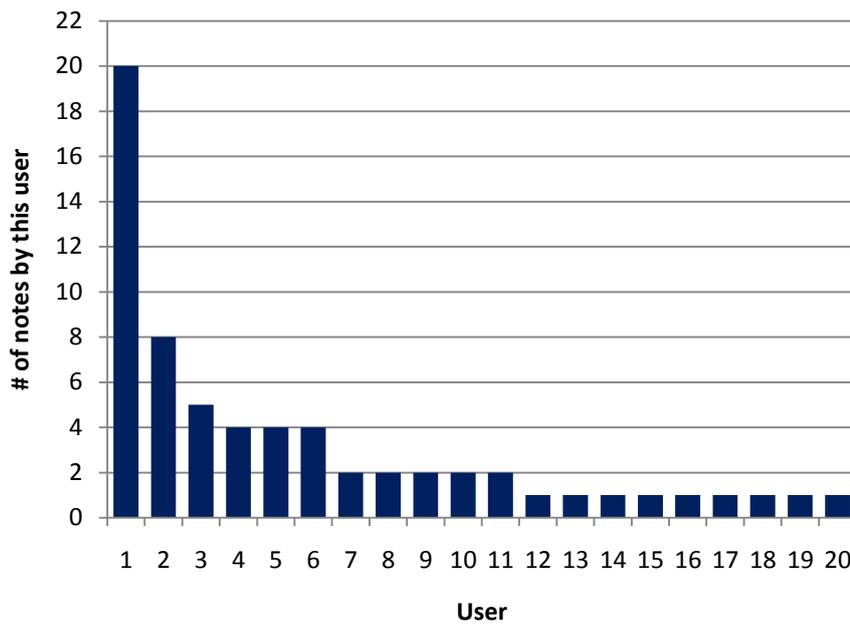
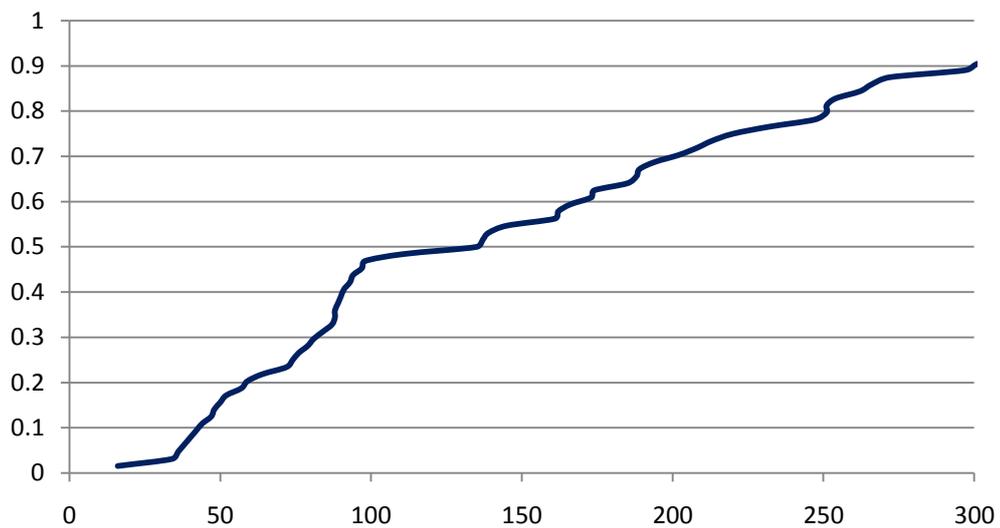


Figure 8. Notes created per user, 1 Aug 2011 – 31 Oct 2011

Figure 9 shows the cumulative frequency distribution of the length of the notes entries. The median length of notes is 135 characters (inter-quartile range, 74 to 220). The longest entry, with 1691 characters, is the full text of a 'virtual review' specialist letter regarding history, status and recommended clinical management of a patient (The author acknowledged in the text of the note that pasting it into CCMS was a stopgap measure until better systems interoperability is achieved).



* The above figure omits the five longest notes, having 344, 540, 772, 843 and 1691 characters, respectively.

Figure 9. Cumulative frequency distribution of the length of notes (1 Aug 2011 – 31 Oct 2011)

Table 11 shows the frequencies with which various topics were discussed in the notes entries. The notes are largely the report of a home or clinic visit, including visits fundamentally related to the NSCPP enrolment process and/or care planning. The notes are frequently used as a means of communication related to assigning tasks and recommending actions for ongoing management of the patient's condition. Notes can also be the result of actions to get into contact (e.g. results of attempts – successful or otherwise – to phone the patient) as well as intrinsic activities of CCMS use (e.g. noting that a user has been added). The visit notes generally include some clinical observations. Many of the notes provide information related to the accuracy or currency of the medication record, often to indicate a change that has been made as the result of a visit.

Table 11. Topics of Notes (1 Aug 2011 – 31 Oct 2011)

Topic	Frequency*	Themes	Examples
Tasks	40	Intention to review	'will review in 2 weeks'
		Plans, task assignments, or recommendations on review, monitoring and ordering of tests	'suggested more blood glucose monitoring'
		Acknowledging task scheduled or completed	'Medication reviewed 29th Aug 2011.'
Observations	25	Measurements taken	'Spirometry shows mixed restrictive and obstructive pattern'
		Laboratory test values	'His creatinine is rising 228 umol/L'
		Recent exacerbations	'still having some residual coughing since exacerbation of COPD 2 weeks ago'
		Reported symptoms	'son rang today, Mum breathing much better'
Medications	18	Dose change	'I have increased metoprolol to 142.5mgs'
		Medication stopped, started, re-started	're started diltiazem 120mg once daily'
		Correcting medication record	'Please change on meds list.her metformin she takes 2 tabs mane, i asked her to take 1 bd as prescribed until reviewed by diabetes team.'

Topic	Frequency*	Themes	Examples
Administration†	9	Noting patient enrolled	'Enrolled in Shared Care today'
		Addition of users to care team	'Added Krish from Cox's Chemist to patients care team'
		Care plan done (or delayed)	'Hi [general practice nurse], Great start to care plan. I have made a few changes. feel free to add more when you see [Patient] again'
Referrals	5	Plan to formally refer to service	'can you please fax thru referral'
Patient Contact	4	Attempts to call patient (successful or not)	'I have made several calls and left messages to get in touch with [Patient] but no success'
Admissions	2	Note of hospital or hospice admission	'admitted acutely to Hospice for symptom control'
Test/hello	1	Functionality Testing	'Hi [general practice nurse] testing'

* More than one topic can be addressed in a single note: mean of the number of topics per note is 1.64

† We grouped communication about care plan coordination in this category (five cases); alternatively, these could be seen as Task communications. We grouped them in this category as conducting a care plan is an inherent part of the NSCPP protocol.

It is interesting that many of the Notes communications would appear to be good topics for the Tasks feature.

Tasks. Of the 154 tasks recorded in the CCMS database as of 31 October 2011, two are recurring tasks; 106 tasks are recorded as "completed"; and 149 tasks were active on the 1st August or later. These 149 tasks, with 281 relevant activities (as task creation and modification) recorded in CCMS from 1 August 2011 to 31 October 2011, were actioned on by 35 individual users, including twelve secondary nurses, ten GPs, five general practice nurses, four pharmacists, two patients, one specialist and one physiotherapist. Figure 10 and Figure 11 show the distribution of task creation and modification activities by users, respectively. As demonstrated in these two Figures, one user (general practice nurse) has created 58 tasks (38.93% of all tasks) that were active during these three months; she has also undertaken 107 task modifications (38.08% of all task modification activities).

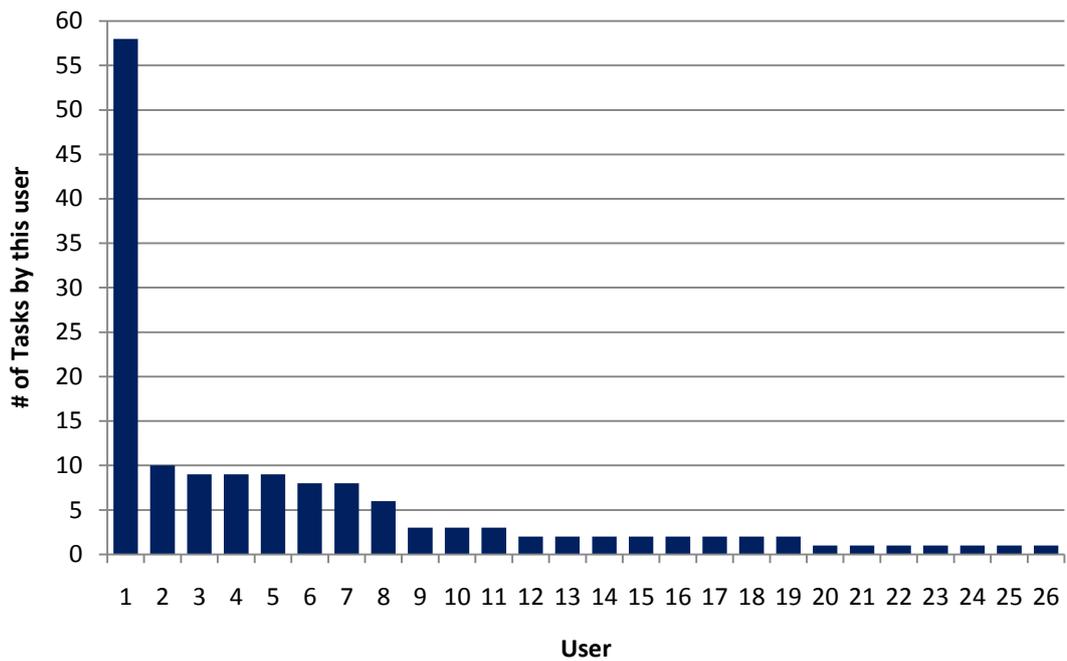


Figure 10. Tasks created per user, 1 Aug 2011 and 31 Oct 2011

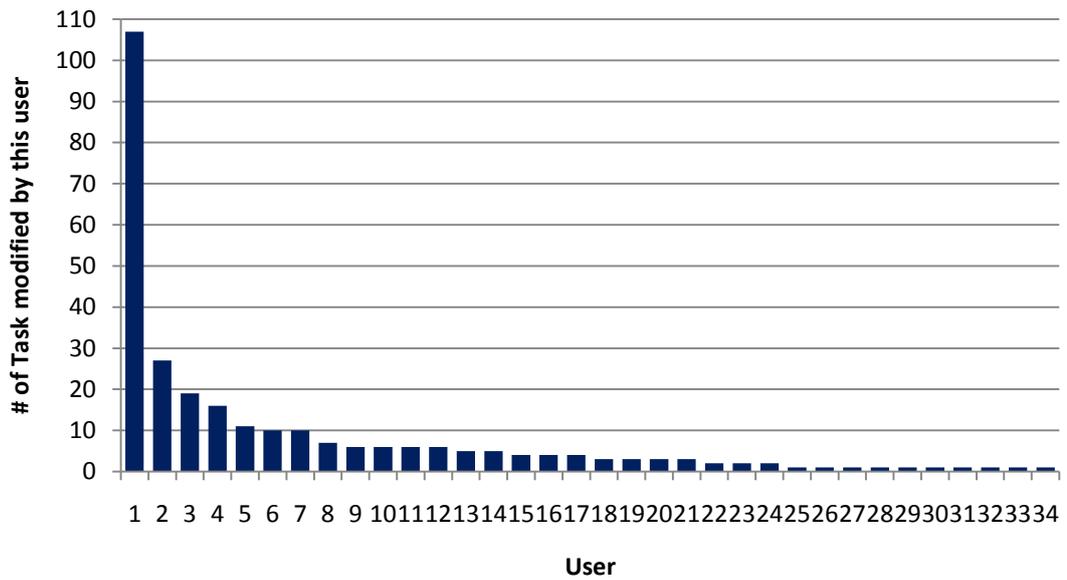


Figure 11. Tasks modified per user, 1 Aug 2011 – 31 Oct 2011

Figure 12 shows the cumulative frequency distribution of the length of narrative of the tasks (including subject line and description). The median length of task text is 74 characters; the longest has 431 characters (inter-quartile range, 38 to 192).

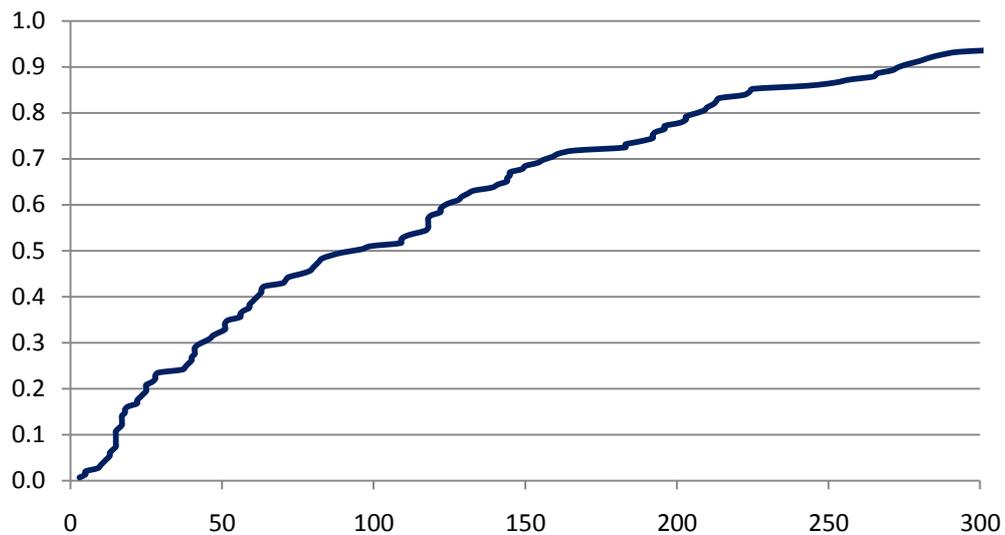


Figure 12. Cumulative frequency distribution of the length of task text (1 Aug 2011 – 31 Oct 2011)

Regarding the use of Task feature of CCMS, nine GPs, six general practice nurses, six secondary nurses, one specialist, four allied health professionals (including three pharmacists and one physiotherapist) have assigned 149 tasks between 1 Aug and 31 Oct. Among these 149 tasks from 1 August, 16 (10.74%) have been re-assigned to another provider (including self). There are in total 35 tasks (23.49%) that were assigned-to-self at some stage. All the 149 tasks have been assigned to thirteen GPs, seven general practice nurses, ten secondary nurses, one specialist, four allied health professionals (including three pharmacists and one physiotherapist), one PHO coach and 22 patients. Table 12 examines all the roles of providers who use the Task feature of CCMS.

Table 12. Roles of providers who assign and/or being assigned tasks

Task Creator \ Assign-to	Assign-to							Total
	GP	General Practice Nurse	Secondary Nurse	Specialist	Allied	PHO coach	Patient	
GP	14*	2	19	1	3	1	10	50
General Practice Nurse	9	19†	18	12	5	0	30	93
Secondary Nurse	7	3	4†	0	0	0	1	15
Specialist	0	3	0	0	0	0	0	3
Allied	0	3	0	0	1†	0	0	4
Total	30	30	41	13	9	1	41	165‡

* Including 10 self-assigned tasks

† All of these tasks are assigned to self

‡ This count includes the 16 re-assignments of 149 tasks.

Table 13 shows the frequencies with which various topics were discussed in the tasks, using a random sample of 50 tasks.

Table 13. Topics of Tasks (random 50 samples from 1 Aug 2011 – 31 Oct 2011)

Topic	Frequency*	Themes	Examples
Follow up assignments	17	Monitoring and ordering of tests and other measurements	Secondary nurse assigning a task to General practice nurse: 'pl review pts weight and uric acid'
		Referral, including virtual review	GP assigning a task to Secondary nurse: 'heart racing incr CHF SOB: Please review if possible - has had episode 6omins heart racing, stable fluid status'
		Recommending further communication	GP assigning a task to Secondary nurse: 'Enrole diabetes shared care: please contact us to coordinate care'
		Care plan review	General practice nurse assigning a task to GP: 'review care plan'
		Meds review required, sometimes with recommendations on dose change, starting/stopping	General practice nurse assigning a task to Specialist: 'His creatinine (228)and e GFR (27)are falling so safer to reduce allopurinol to 200 mg daily, despite good control of his urate (0.37 mmol/L)'
		Asking for or offering help, regarding technology use	General practice nurse assigning a task to GP: 'Hi [GP] - fixed your log on problem, blocked off some time Friday 30.9.11 in am to go over it with you, and for you to add glivec to [Patient]'s meds list'
Self tasking	12	To record, write and review care plan	'Care plan for [Patient]: 1. To stay well without shortness of breath & lose weight target 10 kg weight loss 2. To control gout and prevent it from recurring'
		Observations, symptoms or test result values	'chest xray back and no bi basal scarring'
		To change meds	'Stop aspirin'
		Reminder of patient review (including one case	'Recheck in a months time how he is going.'

Topic	Frequency*	Themes	Examples
		of reminder for patient (NSCPP questionnaire filling)	
Communication of what's happening	10	Meds, current dose or change	General practice nurse to specialist: 'Have copied and pasted 'note' into pt notes for GP to see easily, this pt's current dose allopurinol is 200 mg od'
		Patient's NSCPP enrolment status	General practice nurse to Secondary nurse: 'Have enrolled this lady for [GP] following her discussion with you.'
		The care plan itself	One GP to another GP in the same practice: 'Goals: 1. Improve breathing. Breath a lot better. Walk along the beach without puffing. 2. Concerns with the amount of pills he is taking. Want to eventually cut them down. 3. Quality of life . Plan of action: 1. Continue with medication. Check technique and compliance every visit 2. Continue with walks - snacking like 5-10mins at a time, around the house if it is too cold outside, make use of stairs as well.'
		Cancelled appointment	Secondary nurse to GP: '[Patient] was due to be seen at a clinic appt to perform spirometry today. He has cancelled this due to work commitments. He will phone again beg November to re-arrange another time.'
Tasking patient	8	Exercises	'are you on track with the AB Doer and swimming'
		Promoting NSCPP	'Invitation to Premier showing of short movie on shared care plans'
		To write care plan	'can u fill out yr careplan please once u receive yr new computer'
		Communicating about Care Plan, including problems, action	'read the list of activities to do each weekend, check on quit smoking progress'
Test/hello	6	Functionality Testing	'welcome, please action this task by ticking the completion box'

* More than one topic can be addressed in a single task (three tasks covering two topics)

Use of tasks appears to be largely in keeping with expectations for this feature, although the 10 tasks concerning activity (“what’s happening”) may be better as Notes.

Care Plan Elements. Of the 549 plan elements recorded in the CCMS database as of 31 October 2011, 508 were created 1 Aug or later. These 508 care plan elements were created from 1 August 2011 to 31 October 2011 for 43 patients. Figure 13 shows the distribution of these elements by their type (as per the CCMS options offered to the users).

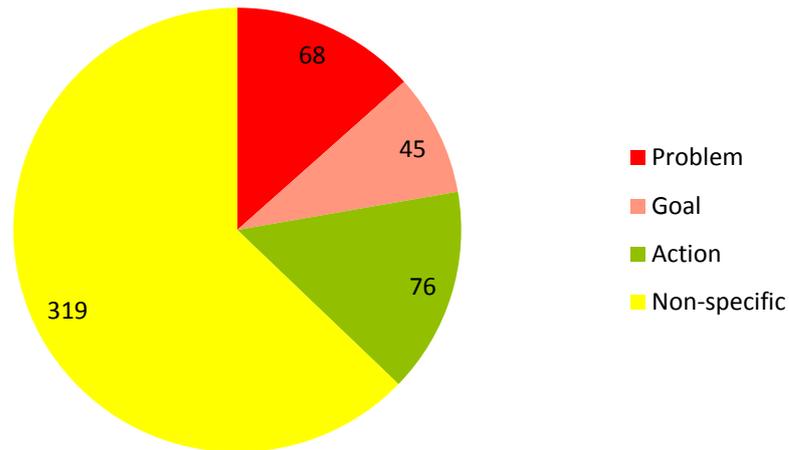


Figure 13. Care plan CCMS user-specified element types (1 Aug 2011 – 31 Oct 2011)

Table 14 shows the frequencies with which various topics were discussed in the care plans based on content analysis of a random sample of 50 records of care plan elements.

Table 14. Topics of plan elements and associated notes (random 50 samples Aug – Oct 2011)

Type/Topic	Frequency	Themes	Examples
Other / Fragment	33	Meaningless leftover segments from plan templates	'My main priority is'
Action*	8	Exercise	'use AB Doer Twist 3 times a week for 20 mins'
		Diet	'weetbix for breakfast, sandwich for lunch, dinner lpate for evening meal'
		Taking medication	'take my tablets every day'
		Smoking cessation	'create list of why I like smoking, why want to stop,'

Type/Topic	Frequency	Themes	Examples
Problem*	6	Condition	'af and copd'
		Surgery recovery	'balance of eating is out of sync for bariatric surgery recovery'
		Observation/symptom	'My hip is so bad I cannot exercise'
		Overweight	'loose big stomach'
Goal*	5	Health goals	'breathe easier'
		Weight control	'keep my weight down to below 89 kgs'
		Less pain	'To have less pain in my toes by Christmas'
		Humorous personal goals	'land on the moon'
Patient's attitude	4	Personal attitude	'postive attitude'
		Patient perception on symptoms and impact on health	'I am struggling like hell'
		Patient concerns	'Health & Appearance concerns'
Resources	1	Family support	'very supportive family'
Task reminder	1	To review patient and meds	'[General practice nurse] will ask specialist to review my gout and my tablets please.'

* CCMS users can choose these types on the template drop-down menu

The high frequency of fragment items in the care plan, as per Table 14, indicates some significant usability problems with this feature. The items appear to be care plan template elements that have not been specialised for the case at hand. Given the very high prevalence of such items, we must be careful in interpreting the quantitative analysis regarding the amount of 'communication' happening via care plan elements.

Messages. There were 78 messages sent in total before the feature was disabled. The last message was on 25 Aug 2011. Messages were used moderately frequently up to that time by five users (four of which were involved in Phase o) (see Figure 14).

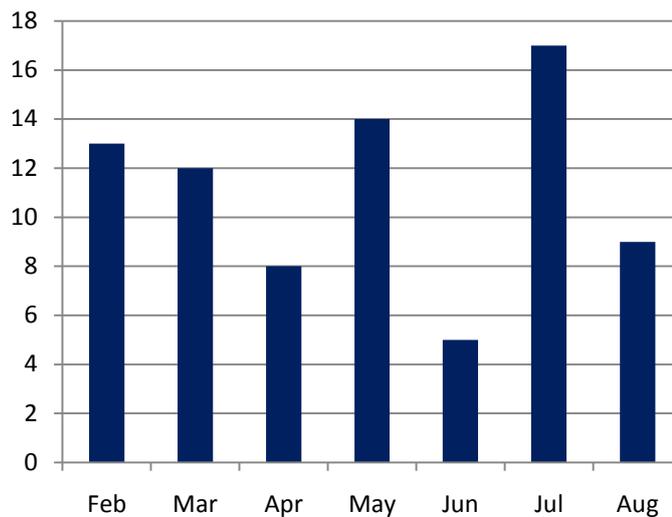


Figure 14. Message frequency (1 Aug 2011 – 31 Oct 2011)

Message content appeared frequently redundant with tasks and notes (see swimlane examples: Table 7, the secondary nurse created a Clinical-Management note on 20 July regarding medication adjustment then sent this information via a message to GP). This feature was disabled in late August.

Discussion. The content analysis above provides ideas for use cases to underpin use-case driven redesign of the user interface (see Recommendations). It can be seen from Table 11 that users frequently discussed tasks in the clinical notes. This suggests an opportunity to reduce keystrokes, and achieve better tool support, if users employ the CCMS Task feature for such content. The high frequency of meaningless care plan template fragments among plan elements indicates that users are struggling with this feature.

The usage patterns are characterised by the dominance of a few lead users. On the one hand, this can be taken to indicate that CCMS use is still not matured in terms of uptake (leaving open the possibility that usability per se is poor, or that a larger issue is presenting a barrier, such as the lack of a clear business case for investing time in shared care). On the other hand, the usage pattern suggests that in each pilot project there is a nurse that takes a dominant role in the shared care activity.

We believe that the tendency for nurses to continue to be the most central hands-on users will continue for any immediately foreseeable configuration of the healthcare system. As such, their role should be equally central in use-case driven re-design. In the design of those use case, however, the essential role of physicians must be reflected, both in terms of face-to-face communications happening in the primary and secondary settings, and in terms of ensuring that the (albeit briefer) online input of physicians is conducted through a user interface that fits physician workflow.

4.4 Questionnaire responses

Patients. Fifty-three patients participating in the programme (72.6% of the total 73 enrolled patients) completed questionnaires – PACIC, PIH and Morisky (see Table 15). The tools measure the patient perceptions of the care systems that provide their care. These perceptions, in turn are influenced by the individual patients motivations, understandings (world view) and expectations of what care is delivered.

The combined tools provide a brief, patient-reported assessment of the extent to which their perception of receiving care is congruent with the perception of the care delivered (as per ACIC and PACIC) and identify where additional assistance may be required (PIH and Morisky).

When the PACIC is paired with the ACIC, they provide a complementary consumer and provider assessment of important aspects of care for long term conditions.

Examining the instrument scores separately, actual PACIC scores (summing over 21 questions) ranged between 14 and 105 (best is 105 and worst is 14). Overall, the mean was 74. The scores of individual patients, averaging over all the questions that have been answered, have very little variance between all participants (mean 3.9; SD 0.7)

The Morisky scores illustrated that for this cohort of patients, they understood the roles of their medications and on the whole took these as instructed (mean 1.37; SD 0.7). For the Partners in Health instrument, the outcome is similar to the PACIC result with individual patient's overall mean being 6.4 (range 2.7 – 8; SD 1.5), leaving room for improvement overall.

Combined, these responses indicate that patients felt they were active in many of the processes around their care and that on the whole, they understood their condition and they attended appointments when required.

Table 15. Patients' PACIC, PIH and Morisky mean scores

Patient questionnaires	PACIC	PIH	Morisky
Responses	53	53	52
Mean	3.9	6.4	1.3
Variance	0.9	1.5	0.7

The PACIC scores were also examined within the five question domains: Patient Activation, Deliver System Design, Goal Setting, Problem Solving, and Coordination/Follow-up. Table 16 illustrates the PACIC scores averaged for each of the question domains. All domains require some improvement with, arguably, goal setting and coordination requiring more focus (which is reasonable given that these are scores at the start of shared care planning).

Table 16: PACIC scores by domain

PACIC Domain	Mean
Patient Activation (items 1–3)	4.1
Delivery System Design (items 4–6)	4.1
Goal Setting (items 7–11)	3.7
Problem-solving (items 12–15)	4.1
Coordination (items 16–21)	3.7

Health Professionals. Scores to the standard instrument, ACIC, by clinical participants of the programme are averaged by their organisation (see Table 17). These scores illustrate the differences and similarities between organisation teams.

The nine organisations who completed the questionnaire were divided into one of the three groups based on their average overall score: low (between 0-5), medium (between 6-8) or high (9+). These scores are moderately good, but all allow room for improvement

The responses showed that seven of the teams self-identified as providing reasonably good support for long term condition care (medium score between 6-8) while two felt that they provided only basic support (low score 0-5). Given the low patient numbers by organisation, it is not appropriate to reflect PACIC scores against the scores of the teams/organisations from which they received their care.

The high variance in the Community Linkages score (instrument range: 0-11) is notable; this variance owes largely to the very low score for organisation 9 (score: 1.3), but some particularly high scores are also present (e.g. 9.7 and 9.3).

Table 17. Providers' ACIC scores

General Practice / Secondary Service	1. Healthcare Organisation	2. Community Linkages	3. Practice Level				4. Integration of chronic care model components	Overall Average
			3a. Self- Management Support	3b. Decision Support	3c. Delivery system design	3d. Clinical Information Systems		
1	5.7	4.7	6.3	6.3	9.2		4.0	6.0
2	8.1	8.3	7.1	7.5	6.7	5.9	5.6	7.0
3	8.1	5.4	5.2	4.5	5.9	5.9	4.4	5.6
4	6.8	6.3	6.4	6.1	7.0	6.5	6.4	6.5
5		7.0	6.0	6.0	5.8	5.8		6.1
6	10.2	9.7	4.8	5.3	8.7	8.4	4.0	7.3
7	7.6	6.7	6.3	5.3	7.9	6.9	5.6	6.6
8	9.3	9.3	9.0	6.3	8.7	8.2	8.5	8.5
9	5.8	1.3	3.0	3.8	8.2	8.2	5.2	5.1
Mean:	7.7	6.5	6.0	5.6	7.6	7.0	5.5	6.5
Variance:	2.5	6.6	2.7	1.2	1.5	1.3	2.2	1.0

4.5 Thematic analysis from documentation, meetings, interviews and forum

Thematic analysis is conducted on the project documentation, evaluators' notes from attended meetings, interviews and one provider forum. As listed in Table 4, there are 267 documents reviewed in the evaluation. Evaluators' notes from attending over 40 NSCPP meetings provide a further source of qualitative data to understand the programme progress. Appendix F: Evaluation Notes from Participating in Project Meetings summarises these meetings.

The evaluators have conducted 21 interviews either as team interviews or individual interviews with over 40 individual health care provider participants and three patients. Table 18 lists the interviews conducted by the evaluation team. These interviews were organised to complement stakeholder input available through the various types of project meetings (which, indeed, provided much of the necessary stakeholder contact and feedback for understanding the progression of the project and its issues). The interviewees and interview topics explored were chosen in response to themes emerging from data collected and analysed up to that point (i.e. they represent theoretical sampling).

All health professional participants were invited to participate in an interview. The survey tool, Survey Monkey was used to enable participants to select the best day, time and whether it was an organisation / team interview or an individual. Five patients were identified from their consent forms as agreeing to participate in an interview or focus forum. Three were contactable and agreed to be interviewed. Table 18 lists the interviews conducted and Table 19 summarizes the findings from these interviews.

In the remainder of this section we present findings grouped under the major domains of the selected evaluation framework: outcomes, social, technology and economic.

Table 18. Evaluation interview participants' roles and organisations

Date	Organisation and Role of Interview Participants
2011-Sep-06	Specialist services team (ADHB)
2011-Sep-08	Primary Care GP (ADHB)
2011-Sep-13	Coach (CMDHB)
2011-Sep-13	Primary Care Team (CMDHB)
2011-Sep-13	Primary Care Nurse (CMDHB)
2011-Sep-14	Pharmacist (ADHB)
2011-Sep-14	Primary Care Team (WDHB)

Date	Organisation and Role of Interview Participants
2011-Sep-14	Project Team Vendor
2011-Sep-17	Specialist (WDHB)
2011-Sep-20	Project Managers (healthAlliance)
2011-Sep-20	CCMS trainer (healthAlliance)
2011-Sep-26	Primary Care Nurse (WDHB)
2011-Sep-26	Patient
2011-Sep-27	Patient
2011-Sep-28	Specialist Team Nurses (CMDHB)
2011-Sep-28	Primary Care Team (CMDHB)
2011-Sep-29	Specialist Clinician (CMDHB)
2011-Sep-30	Coach
2011-Sep-30	Primary Care Nurse (ADHB)
2011-Oct-05	Patient and family
2011-Oct-06	Group Forum

Table 19. Themes emerging from interviews and forums

DOMAIN	THEMES
Outcome	<ul style="list-style-type: none"> Impact on care delivery Coordination and connection Wider access for health gain Improved access to treatment Quality and safety
Social	<ul style="list-style-type: none"> Shared care planning as a concept for improving patient outcomes Engagement and training Supporting patients and Co-design Self management

	<p>Workforce and skill development</p> <p>Team support and change management</p> <p>Maximise enrolment capability and where the enrolment originator needs to be,</p>
Technology	<p>Usability needs review and develop use case approach</p> <p>Non-primary care enrolment – processes and rules</p> <p>Understand communication pathways such as note, task and develop clear guides for use</p> <p>Minimise <i>clicks</i></p> <p>Improve care planning element for simplicity</p> <p>Medications – best management in current environment</p> <p>Maximise non- care team useability</p> <p>Patient portal essential</p> <p>General integration issues with the existing PMS's</p>
Economic	<p>Workforce considerations</p> <p>Medico legal understanding for future planning</p> <p>Overall funding model and incentives</p> <p>Performance indicators</p> <p>Realisation of gains different across the continuum</p>

DOMAIN: Outcome

Impact of Shared Care Planning

It is not possible to demonstrate actual impacts both due to the programme design (i.e. there is not comparative group) but also that this phase has been focused on understanding what are the core elements for effectively implementing a shared care planning programme.

Nevertheless, it is evident that the shared nature lends itself in principle to improvements in many areas across the care continuum. As described above, in focusing on patient-led goals, patient engagement in their wellbeing increases. Setting goals that are relevant and that reflect the person's life context assists with both motivation and a sense of achievability.

With respect to areas in safety and quality for a person there have been some individual, but important, cases where care has been maximised.

Interestingly, it was the increased involvement and engagement by the community pharmacists that began to demonstrate the true potential of shared care health teams and the value of a shared record of care. The following two case examples illustrate both these concepts.

Case 1: A Pharmacist was working in the Shared Care system with Patient X and reviewing medications. Patient X was on Allopurinol. Double checking the dispensing in Testsafe (which has both medication and laboratory results), he noted that Patient X's recent renal function tests were abnormal. He then went back into Shared Care and noted the date the GP had last reviewed the patient's laboratory results. The patient had not had a review in Shared Care since the abnormal result, so the Pharmacist sent the GP a Task to review the abnormal results and adjust the medication level if deemed necessary.

Case 2: A Pharmacist noted in Shared Care that an enrolled patient that she knew very well, had a medication list that did not correlate with what she knew she dispensed in the blister pack. She sent a Task to the Practice Nurse who then phoned her and together they reviewed the medications over the phone and updated accordingly.

Both the above examples illustrate the ability for organisationally and professionally disparate team members to respond in real time to an identified issue (Case 2) but also to respond asynchronously (Case 1) to improve patient care and reduce risk.

Comments from similar team roles, highlighted that these two examples may have elicited a round of *phone tag*, or that the errors may not have been identified at all until a next patient visit which may be 3 months away.

From a patient perspective, the interviews undertaken to date have identified that *not repeating myself to new people* was a common theme (albeit none had been to a new care provider to test this theory out). On the whole, having contributed to their own plan development and having a copy was remarked on as a positive element in being motivated to make changes. For all of these patients the request to set their own goals was new, and one patient remarked that

I try to do what the doctor says but sometimes I don't because, you know, ummm, I forget or it is too hard really because everything else gets in the way. But it is different now because I have said I can do this. It feels different.

This supports the e-mail correspondence by a practice nurse as cited with respect to the theme of **Supporting Patients: Co-designed Shared Care Planning** in Domain: Social (Page 85).

Other themes that have been highlighted as potential impact but not as yet realised, include:

- Seeing changes almost real time;
- Up to date medication lists;
- Quick summary views;
- Patient oriented focus and self management goals;

- Enhanced team work;
- Organisationally agnostic teams;
- Whanau ora at its best.

These are just a few of the snippets from the various interviews and unsolicited emails that have been received.

At this early point the usage potential is also prefaced with the need to improve the electronic tool, and to further develop the support structure to maximise sustainable changes and the related funding support to enable the change to be lasting.

The information gained from the user group forum, from interviews, demonstrations and the Sign-Off Considerations document reinforces that there are still some user elements that require resolving before some of the potential outcome gains will be actual impacts.

Improved Access to Treatment

Again this was highlighted as a **potential** positive outcome with very real benefits for the patient that could be realised over time. There have been some anecdotal comments reported by the project team this type of benefit. The themes that emerged were related to accessing information via task request, to find out when an appointment within the hospital services was planned, and as a question on the status of a patient currently hospitalised. These saved both time and effort on behalf of the primary care team but also alleviated, according to one practice nurse, some of the stress and associated symptom exacerbation of one participating patient.

I was able to call Patient A once [X] responded to my note. I was able to reassure her that the referral had been received and that an appointment letter had been sent. Patient A was so relieved.

However, there were a few more examples where this did not happen and that the opposite was illustrated and that by using shared care the changes were not picked up in a timely way and there were delays in acting on some activities.

One practice team interview also highlighted that “[we have] really good relationships with the secondary service participating in the programme and using shared care actually takes longer than normal... [however] once more services get on board I can see where this will begin to change” [GP].

Another point highlighted by a couple of other practice teams was that the perception that primary care did not see secondary care information was not the case, as in CMDHB as they [GP practices] have access to Concerto and as such all hospital activity on their patients.

One GP commented that:

Shared care would need to perform better than this to really be seen as an advantage as why don't all GPs have Concerto access?

Although others in that interview agreed conceptually, they also said that having access to Concerto did not resolve the element of hospitals knowing primary care information. Also in contrast, in this interview and in two others, the wider potential of allied and other providers roles being linked to the information and tasks etc. via shared care was where some of the greatest potential to improved shared care could be found (also see the Pharmacist comment under the **Impact of Shared Care Planning** theme above).

Quality Improvement

Overall, the involvement in shared care has been very person(s) specific and not whole of practice or whole of team. As remarked, the change management support was minimal and hence it was not surprising that this is not evident at the end of Phase I. One primary care nurse participant indicated that the staff of the wider practice were taking a 'watch this space' approach.

However, an interesting example of an indirect systems benefit of shared care mentioned by one practice was the improvement process that occurred when searching for potential [LTC] patients to be invited to participate:

[Shared care] made us look at what we had coded etc. in a few cases there was no actual confirmed diagnosis so we really were able to clean up our systems. Some had no diagnosis in the system, yet were being treated for health failure for years. So I could say now that we know all our [LTC] patients. Makes me think what else is in need of this?

DOMAIN: Social

Shared care planning as a concept for improving patient outcomes

The premise of introducing a shared care planning approach and trialling it was based on extensive consultation nationally and regionally in 2010. The outcome of these consultations was the development of the Shared Care Planning Programme. At a high level, the expectations from the consultation process and the language and principles shared by the participants firmly embedded shared care planning as a way forward for supporting people with long term conditions.

*[Shared Care] is where we need to go. Having visibility of the whole of the patient's health interactions can only mean we have improved care delivery, less harm and stopping waste. I wonder how many tests I order that have already been done, but I just don't get to see either the outcome or that they have been ordered
[GP]*

To be able to quickly see what has happened before and then support those decisions can only be a better way of working [Specialist Nurse]

It was also discussed positively from a conceptual view by patients, with one interviewee summing up the consistent theme of the other patient contributors when she remarked:

To me, [share care] should mean that I shouldn't need to tell them everything right from the beginning, you know, when I see a new person. I mean, this can only, you know, be better for us. Especially since I sometimes forget, like, what drugs I have been told to stop or to still take and why. It will be nice to know that this information about me is available
[Patient]

There were some variations amongst the health professional participants when discussing the benefits they thought shared care would be able to deliver. Some highlighted that the shared communication and a collective view of a person's record was what they saw as the main outcome of shared care planning approach. Examples of how this would occur were focused on that this single view could quickly mitigate the difficulties in decision making where delays or potentially under optimal care is planned because of missing information or results.

Others highlighted that the patient's engagement with care plan development and shared ownership of the care journey was the essential feature of shared care. Further to this, these participants saw the care plan as providing a means with which patients could not only determine some of their goals but also look at how their activities linked to these goals. Specific reference to the patient portal as a "fantastic enabler" was made by all these respondents.

Two respondents remarked that improved coordination was where they felt the main gains would be. Examples of coordination in this context were linked to reduced duplication of tests, common understanding of next steps for care delivery, and the improved ability to maximise medications. Interestingly, there were no polarisation of views between health professional roles or organisational affiliations in the responses, with all roles and groups spread across all views.

Participating in the Shared Care Planning Programme

When respondents were asked about their introduction to participating in shared care, it was evident that the conversations and discussions were focused primarily on the Doctor interface. This was most noticeably evident in the primary care interviews but also to some extent at the specialist service end as well.

I was just told about [shared care] and that [the practice] was going to participate. I did not really know what it was about or anything. It would have been good to have been involved early as it really does seem to be us nurses doing a lot of the activity, um, the plan and requests and such..
[practice nurse]

However, one team reported a different experience. They described a demonstrable team work process where all team members were part of the discussion to participate and that the final decision making was a collective agreement to participate. The respondents remarked that

they felt that because of the team work approach it was easy to see where the efforts would be needed and whose roles they were likely to be assigned to.

These two different experiences also illustrate where the initial gains or 'low hanging fruit' for shared care planning was placed during the engagement of participants into Phase I. For the former group the participants (both health professional and project team) remarked that the focus on the communication between primary and secondary *overshadowed the other elements of the programme particularly the care planning part*. The connection to a model of care was somewhat lost as an overall goal of the programme. This is also reflected in some of the transactional analyses (e.g. as presented in the swimlanes models and the content analysis in the previous section).

Another respondent remarked that;

There was a lot of discussion on the communication ability between us and primary care. It was like this shared care model, or what ever we call it, was accepted as a given, you know, care planning, integration, patient owned but we are all at different stages and I suppose, not really knowing what the expectations for this programme were I certainly latched on to the easy bit [communication channels]. Going forward this [model of care] needs to be a central part of the implementation strategy [Secondary health professional]

The above comment was supported during the Group Forum when a number of participants talked about the importance of a *whole of system change* and that the specific care planning element needed to have more training to *build on our current skills*.

Interestingly, two of the three patient participants interviewed highlighted that the communication between providers was where they felt that shared care could offer the most gains for them. Although, interaction with the shared care programme has been short, one patient commented where they could clearly see the value of this programme and why they wanted to be engaged (even though, in this particular case, other coordination technologies such as better use of existing facilities for electronic discharge summaries should have sufficed).

I came out of hospital and my GP didn't even know that I had been in, I was amazed. I just assumed everyone was told. Then what surprised me more was that he also didn't know about they did or changes done. I couldn't remember, you know, I was pretty sick and they looked after me good, but it was a bit of a hassle for him [GP], I think to find out what needed to happen now for me. I tried to remember what I was supposed to do, but well, I just hadn't taken it all in. This [shared care] would have been great then. [Patient].

Supporting Patients: Co-designed Shared Care Planning

The role of care planning and co-design with the person/patient (and even the family) as part of the team of care, elicited an overwhelming positive response. The language and principles of patient engagement and ownership as core elements to improving health outcomes and patient wellbeing were peppered throughout the health respondents' comments and also

throughout the programme documentation. It was also remarked on positively by the patient participants directly and within their unsolicited feedback to various health care teams.

Despite this support, all respondents articulated that co-designed care planning was difficult. Two themes emerged that summarised these difficulties. Firstly, **Time** or lack thereof, and secondly, **Care Planning Skills**.

Co-designed shared care planning is a time consuming activity and the current structure of primary care, including the funding model, does not lead itself easily to this process. A few comments from primary care illustrating this are;

We are just not really geared up to do this [care planning] routinely. [GP]

Often the patient comes in with a specific issue and we resolve that and off they go with a few pointers of what to do or what not to do...you know [GP]

We [nurses] usually do the care plans but it is not always joined up in a systematic way. I may have a note to connect with a patient for a longer consult and have invited them, but in the mean time, they ring for a Dr's appointment. Then I notice the next day or after, you know, when I realise that they [the patient] have been and gone. I know they won't come again so soon. Not if there is a cost, but also it is a chunk of time out from them. We are not terribly good with our systems to make this work better between us and to the patients benefit, you know what I mean?. This programme [shared care] should help because the GP can see that I am wanting to work with the patient or even that we have some goals and he could reinforce them. Hmm that would be great. [Practice Nurse]

Although time constraints was remarked on as less of a barrier in within specialist care this group still remarked that care planning took time.

Overall, it was clear that there was a tension between wanting to provide the best possible care to patients and the pressure of the next patient waiting in the waiting room who also needs care. This tension seemed to be emphasised more by the primary practices that did not have a specific nurse with a long term conditions focus but given the size of the participating groups (eight primary care practices) it is not really possible to be definitive. However, where this role was present, the time factor issue was not diminished in any way.

Further compounding the time element was the application of well validated tools for supporting care planning i.e. Stanford, Flinders, brief intervention, motivational interviewing, etc. If they are applied according to their design, and where the evidence of effectiveness is known, they take significant time. Application of many of these tools is simply incompatible with the 15 minute consultation model of most primary care practices. Furthermore, much of the visit interaction is framed around the immediate issue rather than the longer term plan and as such the time to

....concentrate on the wider needs just gets a brief brush over. I mean that is just the reality of our work [Practice Nurse].

The second consistently mentioned barrier was **care planning skills**. Although linked with the time issue, developing a care plan that is useful, patient- and context-centric, and has meaning to both the patient and the care team takes learning. Throughout the interviews, and at various programme and clinical meetings, it was pointed out that effective co-care planning requires the skills and support.

Even with being Flinders trained, I find it hard to do care planning that is patient framed and with their goals rather than what I want for them. We want the best for our patients and sometimes we forget our goals are not always theirs. It takes practice and support for us. [Secondary Service Nurse]

However, even with both these difficulties, an email comment from a practice nurse highlighted that in just introducing the concept to patients and really trying to involve them;

Something magical happens when I explain e-shared care [Shared care planning], pt very interested in developing their own care plan, goals etc [e-mail correspondence]

The three patients interviewed remarked that they had only one main interaction with their health carer to develop a care plan; all three said that they participated in what was written and had been given copies to take home. One patient remarked that they had had care plans in the past but this was the first time where a goal was set that really resonated with her.

It was like having someone really listen and then help me match what I need to do with my life and what I really can do. It feels achievable [Patient].

Team Work and Care Coordination

The wider shared care health care team potential for health outcome gains is illustrated by an email received from a pharmacist who had only been involved in the programme for a matter of weeks but was enthusiastic with the possibilities for working collectively for the patient and maximising the gains for each encounter they have with the health sector. A few of his thoughts on the impact of shared care taken from an e-mail are:

- ④ *Synchronise doses: simply explaining that medicines can be taken together and synchronising so that all medicines run out at the same time.*
- ④ *Dose frequency rationalisation- working with GP to make changes eg. using a long acting preparation.*
- ④ *Discontinuing medicines*
- ④ *Compliance packing*
- ④ *(Strategies for intentional and non-intentional adherence – taking large pills etc,etc)*
- ④ *Patient education, Addressing Behavioural issues e.g. beliefs and attitudes*
- ④ *Patient Supplies*

Other things pharmacist can do is additional/supportive role: blood pressure checks, glucose monitoring (clean/calibrate meters), asthma spacers/peak flow checks/mobility supports etc etc

I might miss some more things but u can see pharmacists working at a primary level could be valuable/supportive to patient care. End result would be better quality of life for patient and less admission to hospital.

Non Direct Care Team Access

A clear principle of the programme was that shared care planning was not just for the active health care team members but that accessibility of this record to those outside of the active care team was an important functionality. This was operationalised by the programme by making Shared Care accessible to any professional who had access to the secondary system Concerto.

An active communiqué informing clinicians about this functionality was circulated (as per Figure 15).

Accessing Shared care Information via Concerto

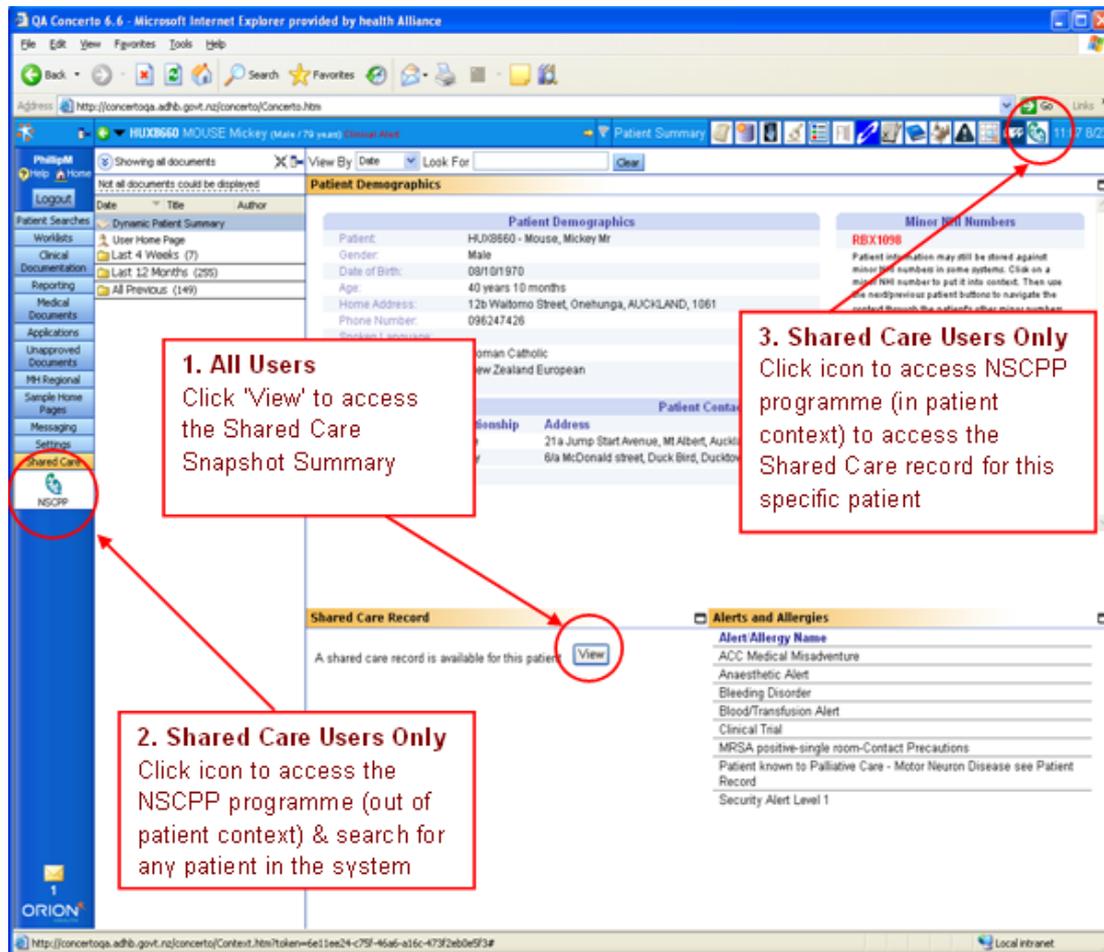


Figure 15. Communique informing clinicians about Shared Care access via Concerto

However, unlike any other new electronic programmes, there was no associated training or familiarising of this capability been undertaken at any of the partner DHBs. The low numbers and small secondary services engaged at Phase I was the main reason for this and as one participant said

... the value of this element is likely to be] *under realised for a while until more secondary services are involved and the patient numbers grow*

Patient Participation in their Own Care

The engaged proactive patient is identified as a core outcome of shared care planning. A key strategy to meet this outcome was the development and introduction of a patient portal. There has been a raft of development meetings with excellent input from the consumer forum as well as regular direction from the consumer representatives on the Steering Group. The involvement of a user-testing group also has contributed to the first iteration of a patient portal. The portal went live end of September 2011 with two patients from Mangere Family

Doctors the first testers. As of 31 October 2011 there are 8 users. None of the patients interviewed had access, however they all indicated that they liked the idea of accessing their record (albeit none could really say what they would look at or use it for). Interestingly, one respondent did make a comment regarding sending messages.

Can you send messages to my GP? That would be great. Sometimes I just want to ask something, but I don't want to bother them there as they are so busy.

When probed a bit more on what sort of question they may wish to ask:

Mmm, let's think, sorry, can't think off hand at the moment, sorry

The response above suggests that understanding patient needs will need to be a central element for Phase 2 and that involving patients more directly will be critical.

Feedback from the practice where the portal users reside indicates that it is viewed as a great advantage despite it being read-only at this stage. According to the usage records, one patient has made multiple visits to their plan. However, this has led to a raft of conversations generated by the patient to the practice nurse. A summary email highlights this;

One of the patients who has access to the Portal, is quite active in reviewing the info on the portal, and has a lot of questions for [Nurse]. He keeps calling [Nurse] and asks her for additional info, wants to assign tasks to pharmacist, GP, etc. [Nurse] has to spend a lot of time on the phone with this patient. Because of this time commitment, [Nurse] is a bit reluctant to enrol any more patients into the Portal. [Project Team]

The above concern and experience has been reflected by a number of other clinical participants. Overall, most agreed that in principle the patient portal is a core strategy for shared care planning, but there are some fundamental processes that have been highlighted as needing consideration. Notwithstanding the wider medico-legal issues that were briefly touched on by a few, one GP summarised the general theme about the portal:

The three Rs still need sorting, you know, Roles, Responsibilities and Rules, especially when it comes to messaging from patients to any of their health care team.

The other area of concern as summarised by a Secondary Specialist was:

The issue of patients contacting their health care team is one that still needs careful thought, and wide discussion. I have no doubt that there is a definite place for this, but it is a major change in routine clinical practice and one which many clinicians have raised concerns about when I have talked about the NSCPP. These are real concerns and our current approach does not support the time or resource to maintain this for all the patients that we see. Are we giving members of the healthcare team an option not to be contactable in this way by the patient? [e-mail]

The expectation is that these elements will need to be resolved including clear guidelines and expectations before opening this kind of interaction with patients and health care teams in any substantive way. This is similar to the conclusions by the project team and is documented in their ongoing early plan development and work stream framework.

On a positive note, a few people were keen to convey that this does not preclude the fact that the patient portal can be a source of information and links that can be tailored to the individual. The possibility of having test or medication due reminders, or pre-assessments for patients to complete or undertake before appointments, were a few suggestions about future developments for the patient portal. It is clear that this project is not going to be able to deliver on all of this; however, it is an important developmental aspect that needs consideration and focus for Phase 2.

Team Support and Change Management

The team support or coaching model structure was a recommendation from the Pilot Phase. It is evident that the division of this support role across the different primary care PHOs and within diverse existing roles has “diluted the support that we need to really take this programme up” [Primary Care Nurse].

The limitations to devolving the support roles to the existing PHO primary care team members were well understood and articulated at various meetings and workshops. It was accepted that the effect would be too diluted due to other responsibilities by the practice coach members. As such the it is not an unexpected outcome that some of the wider systems changes and delivery modality changes that were noted as being an outcome from enabling shared care planning have not been realised. The overwhelming message from respondents was that:

This is a hugely innovative project yet we have no real change management support to enable it. This needs to be really thought through carefully going forward if we want to see the real benefits of shared care planning. [Secondary Specialist]

DOMAIN: Technology

The project team have articulated a very thorough and detailed assessment of some of the limitations of the technology as it stands and what they believe need to be resolved before a Phase 2 deployment should be enabled.

The project document certainly ties with both the various notes and interviews with users. Many of the responses can be linked to the overall technology questions:

- Does the system design fit effectively within normal clinical practice and current PMS systems? Was the mechanism for creating the shared care team (s) straight forward and efficient?
- Security of data; transmission, monitoring, reporting, patient confidentiality?

- Was the quality quantity and value of information, pre-population of key data, form structure, acceptable?
- What were the issues relating to integration with other systems and the transfer of data to and from those systems?
- Did the introduction of the shared care plan solution facilitate the basis for the creation of the summary care record and what were the barriers to their development?
- Is the system performance adequate to support use during delivery of care
- Did the system interface, flow, structure encourage or inhibit usage by clinicians and patients

Does the system design fit effectively within normal clinical practice and current PMS systems?

Currently, feedback is frequently that the system does not merge with current systems of care and practice workflows. It is difficult for any system to do this seamlessly as each primary care practice has its own way of working, and this contributes to the variation in use. It is clear that the system is expected to marry to existing workflows; and that when it does not fit or even challenges these flows the early response is one of decreased use. As the change management support was minimal it is not surprising that reflection on potential gains and then adaption to a new way of working has not been prevalent.

Did the system interface, flow, structure encourage or inhibit usage by clinicians? Was the mechanism for creating the shared care team (s) straight forward and efficient?

Over the course of Phase 0 and Phase 1 the mechanisms and modes for **communicating** between professionals has changed. In the initial release, there were there means for communication, Notes, Tasks and Messaging. It was evident very early that there was confusion in the functions of these and Messaging was switched off. This enabled a clearer examination of what type of functions were required for communication and what was needed to capture as a note subsequent to an activity or task response.

Although, in principle the functions of these options were clear, the system functionality did not lead the user to the optimum utility. In fact, one user conceptualised the task function much like a chat room and responded to the original task, within that same message form. Whereas, this user added their information after the previous text, another user also operating similarly, deleted the original message and entered their response. In this latter example, the original information was lost.

The user group meetings identified that this chat room style was useful, the current functionality did not lend itself to this mode and as such, a modification of the system was made to only enable the original task to be viewed only and responses would be completed in the notes.

As this is a new way of interaction, it will be important to understand just what role these functions serve and then design the form to meet them.

Creating a Care Plan has consistently been highlighted as being difficult, counterintuitive and too 'clicky'. Two factors combine to generate this difficulty. The first centres on the perceived paucity of effective care plan development **skills**, which is reported in more detail above in the findings under the: Social Domain. The second is the general **usability** of the system. A system should guide a person easily through the steps or actions culminating in the completion of an action or result i.e. a care plan. In this case, the care plan development was far too complicated and work processes confusing.

Currently the system is not at this level of sophistication. The following comments by a practice nurse and a GP reflects the common remarks and collective user group meeting discussions:

I am relatively IT literate but this is not easy to use, nor is it intuitive.... Too many clicks and need to go to different pages or screens.

*[the current system design does not support care planning]
...it makes the job harder. I need to concentrate on the system rather on the job at hand... creating a care plan.*

Figure 16 illustrates the workflow needed to create and populate a care plan within the system.

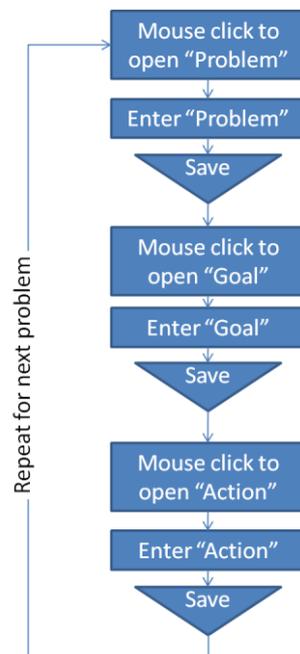


Figure 16. The workflow in creating and populating a care plan in CCMS

These two factors combined have been linked regularly with the low uptake and the slow enrolment of patients into the programme.

Greater simplicity and consistency of tools (e.g. whether to scroll or page when content doesn't fit the box provided) is needed. Users have also pointed out that there is a need to implement a better mechanism for recurrent tasks. In the words of one user, overall "the [current CCMS feature] mix does not make the system intuitive to use and user friendly."

The above two usability issues are illustrated in Figure 17. For consistency of tools, the screen shot shows how one page has both page and scroll functions to manipulate around their sections.

The task element has been highlighted as a positive function; however, if you set a recurrence all those tasks appear in the task box. If there are other tasks, it is not simple to know on what page these may be.

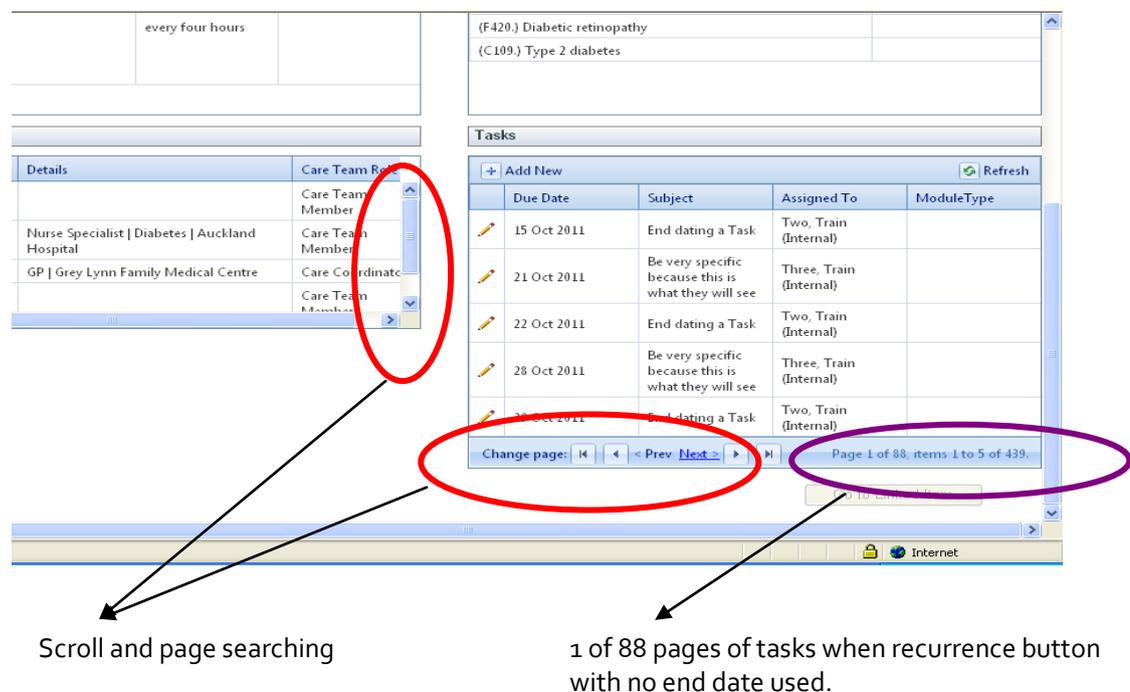


Figure 17. Illustration of CCMS usability issues around consistency and managing recurrent tasks

Security of data; transmission, monitoring, reporting, patient confidentiality?

The system has role identification but only one layer of security identification, which currently translates to an outcome where all enabled users can view all patient enrolments and details. For the moment, with small numbers of patients enrolled, this is not a significant issue; but as the health teams grow and membership rolls grow this will need careful consideration and planned design.

The current structure also allows visibility of all names of people in the health care teams; this includes patients, as the first principle is that this is patient/person centric. However, the current structure means that when examining the care team list, all names are viewed – even

patients. This in turn means that patients, once enrolled into portal access, can see other patients' names. Although they have no access to detailed information, it does raise concerns regarding confidentiality. Like the other usability factors, it is clear that significant work on the patient view and the portal will be needed.

Was the quality quantity and value of information, pre-population of key data, form structure, acceptable? What were the issues relating to integration with other systems and the transfer of data to and from those systems?

These two questions are inter-related. The two practice management systems in use by the primary care practices participating in the programme have differing dynamic integration. One is very labour intensive (MedTech) in that a daily manual push is needed to inform CCMS and no automatic updates from CCMS feeding to the PMS. Complete duplication is required to ensure that activity in CCMS is conveyed into the PMS to ensure information integrity. A separate password is also needed so an additional step is required. Respondents using this PMS have regularly remarked on this as a *major frustration* and, although not stated by all, this issue was seen as contributing to the barriers for increased uptake and enrolments.

The other PMS (MyPractice) is enabling a dynamic interplay which enables a more streamlined approach.

There remain significant issues with the medication summary concept. CCMS is attempting to present a summary of active medications from the PMS. The current structure of the NZ PMS is that it does not recognise that concept. It is in fact a prescribing function not a recording function. Therefore, as the PMS does not have the concept of 'ended' (i.e. stopped medications), the medications pre-populated in CCMS can in fact be no longer active for this individual. This has meant that the summary medication list view is less than optimal for understanding the current active medications. This is not a CCMS issue as such but a wider issue with respect to medication management and PMS usage practices.

Problem or diagnosis lists are similar to medications. The fields that are mapped into the CCMS fields are sometimes not diagnoses but instead are a problem or an outcome of an assessment. This mismatch then creates an incorrect and, at times, an illogical problem list that does not facilitate the overall goal for shared care planning (which is a shared understanding of the person's needs and problems).

Both the medication and diagnosis elements are high on the list of concerns for respondents and the user group as they undermine the sense of trust in the system.

Is the system performance adequate to support use during delivery of care?

The software solution is still commented on as unwieldy for promoting significant increased uptake. The intent of Phase 1 was for limited health provider deployment but with up to 500 patient enrolments. It is obvious that with only 73 people enrolled that there are still some factors that need to be resolved of which useability is a high priority.

Relatively straightforward improvements in the user interface consistency could contribute to its intuitiveness. Overall, the system would benefit from use case driven redesign along the

lines recommended for task communications as per above. These are superficial software changes from an architectural perspective, but they need to be done systematically through an interaction design process with user engagement.

DOMAIN: Economic

At this point in the Shared Care Planning programme implementation it is not possible to identify measurable economic benefit. In keeping with some of the above comments on shared care per se, the overwhelming theme is one of potential economic benefit. Nevertheless, this also came with some significant caveats. The key one was that shared care solutions require that the existing funding models have a significant and deliberate review when it comes to the economic and financial compensation architecture proposals.

All participants remarked that shared care takes time that currently is not clearly or simply funded under the existing health care funded model (i.e. capitation for primary care or population based funding for DHBs).

It was evident from the conversation, meetings, forum and interviews that the existing additional programme funding models, or funding sources such as Care Plus, also do not address the wider shared care team element (e.g. the pharmacist, the psychologist). How will activities such as medicine review or anxiety assessment requests to these shared care team members be funded?

Furthermore, the other theme that emerged is that the savings through shared care are not always realized by the group / sector creating the saving. The common example used to illustrate this was the reduction in hospital admissions was enabled through shared care activity but the saving is with the hospital, whose staff may not have participated in any of the *shared care activities*. This will be and is a significant barrier because providers will certainly not invest in shared care and better coordination etc. if the resulting comparative savings pay off exclusively in the balance of others.

Although this programme will continue to examine these elements an attempt to understand where these costs, savings and changes occur, it fundamentally will not be able to describe a solution without examining the wider social context with which this programme fits. Anything that is identified using this narrow scope will miss the other flow on effects or unintended consequences in other area, such as voluntary sector, family etc.

4.6 Summary assessment

Table 20 below provides the summary assessment against the identified domains and some of their key aspects.

Table 20. Outcomes against domains of interest for shared care planning implementation.

Domain	Summary Outcome
Health Outcomes	<p>Perception of improved patient motivation and overall health service experience through goal setting and shared information</p> <p>Potential for record access by providers outside of the direct care team</p> <p>More than just exchanging information</p> <p>Encourages improvement of health record quality</p>
Social	<p>Strong in-principle support for shared care, although often difficult to fit to practice workflow</p> <p>Challenge of staff having time, and skills, for shared care planning</p> <p>Need to better define modes for patient participation</p> <p>Need more change management support overall</p>
Technology	<p>Feasible to use for conversations around coordination of care</p> <p>Requires use-case based re-design of user interface and clearer expectations of users</p>
Economic	<p>Requires review of existing funding models</p> <p>Challenge that savings will often come to different group than those making the major shared care effort</p>

There are still some large challenges for the programme going forward. The findings plainly indicate that, for the current users, the concept of shared care is the clear direction forward, especially for people with long term conditions. It was clear that the idea was more than a shared view of information; rather, it was about shared care that was both organisational and to some extent professionally agnostic. The survey instruments identified that for the patients and the providers, there was a general sense that care was both well-delivered and well-received. The lower scores for coordination reflect the current environment of the transfer of information. The opportunity for the shared care programme is that it has the potential to truly enhance coordination and engagement resulting in the information being available to all care team members when they need it. The early development of the patient portal will also begin to build the evidence on how patient owned information may be a tool in the supported self-management toolbox.

The focus on the activities of care with the patient and family by centralising activity around a care plan is an area where more evidence is needed. As noted in the literature review, the evidence at best is equivocal. It will be clear that measures and indicators for evaluating the impact of this will be important. The timelines going forward, however, will mean that it will be difficult to say anything of real substance.

The paucity of skills for care plan development and change management were consistent themes. Understanding the core elements for sustained skill development that translates to nimble and flexible implementations will be a challenge in the current health structure of face-to-face and the 15-minute consultations. The evidence suggests that teams are needed for the

long term gains.⁴⁹ The findings showed that where a specific person was responsible for the coordination of care, the overall utilisation of shared care planning was better, than when shared care was managed by individuals operating independently within their organisation. This is a significant shift and will require good evidence to support such potentially substantive system delivery changes. Areas for ongoing examination will be needed to obtain a better understanding of functional roles and jurisdictions within the cross organisational team boundaries and professional boundaries. An early introduction to the notion of multidisciplinary, team management skills as well as a greater involvement with decision making are some starting strategies that will be likely to be needed to understand and optimize team work.

The notion of the agnostic team that crosses profession and organisation – and where the primary focus is fully with the patient – is not new, but has been difficult due to the paucity of means to enact it. Video conferencing, multidisciplinary team meetings and case reviews are the traditional and current modes for this to occur; however, they are heavily orchestrated and really are only for the very complex cases. Shared care offers a means with which these could be simplified, and made more efficient, but also offers a similar dynamic for the less complex. Examination of the wider care team principle and what stakeholders would view as success will be an important step for Phase 2.

This also ties into the non-care team view (i.e. the 'break glass' potential). There are a number of other pilots that are examining and implementing this capability (e.g. Counties Manakau ED project and Canterbury DHB summary record). All are in a fledgling state and will require critical mass before the real benefits are realised.

The other side of this is the patient ownership and partnering in this process. The role of the portal will be an important piece of the ongoing work. The shared trust and expected joint relationships between teams and the patient at the centre will require closer examination as the programme moves forward.

Hand in hand with the above is the longer term recompense or funding discussion. Funding models will need to change, but the existing evidence is hard to translate to the NZ environment as the resources that have been used to support some of the programmes which are used for demonstration projects are substantial and not replicable across the NZ context.

Clearly, to be viewed as successful, health outcomes will play a factor. The early signs of safety enabled by a virtual team environment are certainly positive. Capturing improvements in health metrics will be harder, but it will be important to see if share care can promote evidence based practice, challenge treatment change inertia and enable a more engaged patient leading to a change in risk factors or other metrics.

Arguably, and finally, the enabling factor – technology – will need to develop more maturity alongside the same maturity development of the users. It is clear from the findings that technology is seen as the enabler, but in its current state it is perhaps a slight 'disabler'. With enhanced usability, achieving much greater enrolment numbers should be feasible.

5 Recommendations

The NSCPP has been evaluated through a combination of document review, participation of meetings, conduct of interviews and a workshop, patient and provider questionnaires, and in-depth analysis of the electronic records in the CCMS database, and supported by a review of relevant international research literature. These inputs lead to recommendations by NIHI in several areas. First, we provide reflections on the overall nature of 'shared care planning' as manifest by Phase 0 and Phase 1 experience. We then provide seven specific recommendations for near term activity (indeed, requiring urgent consideration as the project presently rolls forward into Phase 2). We then elaborate on our recommendations concerning interaction re-design and areas for expansion of the user base. Further, we provide a recommended evaluation plan for Phase 2, suggest a timetable for upcoming activities in accordance with our recommendations and point out limitations of the evaluation methods.

5.1 What is 'Shared Care Planning' (SCP)?

The Phase 0 and Phase 1 experiences points out some major questions about the nature of SCP. These questions reflect a contrast between ideals of what it could or should be, and what may be valuable and most attainable in the near term in the NZ health system as it stands.

1. Is SCP physician or nurse driven? We find nurses do most of the SCP work, particularly in terms of creating content in the CCMS database; this even extends to task assignment (a rather direct indicator of who's driving). It has been pointed out to the evaluation team that this quantification underestimates the steering provided by physicians, indeed at times even literally looking over the shoulder of the nurse operating the software. It certainly does *not* capture verbal communications that occur between nurses and physicians onsite (which are not mediated through CCMS). The ideal answer may be either that the GP is the driver, or perhaps that it is truly a collaborative exercise where direction moves about in accordance with patient need. For the near term, our perception is that specific individual nurses – in community or secondary settings – will be the drivers of SCP activity for substantial patient cohorts. As SCP becomes more absorbed into practice culture, we may move into more truly shared dynamics. In the mean time, we have to address protocols by which all key providers acting as members of the SCP team for a given patient provide timely responses to CCMS based communications (i.e. to set minimum standards for behaviour of those 'on the team'). Thinking more broadly, there are potentially profound health workforce implications in SCP, including the potential for novel health provider roles, as well as questions of how responsibilities fall in an environment of distributed online communications.
2. Is the patient 'at the centre' of SCP? The patient is of course the central interest of SCP. Practically achievable levels and modes of patient participation in SCP will, however, vary greatly with patient capacity and inclination. It is a tenant of Wagner's model¹⁹ that the patient should be 'activated' and a requirement of the Flinders Model⁴⁴ to systematically elicit and track problems and goals in the patient's own terms. As such, the development of a care plan based on a face-to-face session with the patient appears to be a minimum requirement. Development of clearer protocols

and associate functionality for more direct patient engagement (e.g. patient online questions) is a clear priority for Phase 2. With this said, the other side of Wagner's model is the 'prepared, proactive care team' and a tool the value of a tool that could fuse our present system of un-integrated providers into such a team should not be underestimate. A very great proportion of the volume of communications may well continue to be amongst the professional care team members, particularly for patients with complex clinical needs such as those that form the focus of Phase 0 and Phase 1.

3. Is SCP about plans or records? There is a real question as to how central 'the plan' is as the key artefact in SCP – is the key element of SCP 'shared care' or 'care planning'? There is great potential benefit in shared discourse amongst clinical users around relatively narrow clinical matters, particularly medication issues. Such discourse centres on a complete medication record and supporting laboratory test results, clinical observations and related notes. It often involves a narrow, tactical plan such as to titrate a dose if a test result stays on one side of a particular threshold value. This is valuable 'shared care' – and could even involve the patient directly in terms of reporting side effects or measurements they take at home. But it may be awkward to force this activity into the structure of a hierarchical care plan stemming from a care planning session with the patient. On the other hand, the more that SCP interaction occurs outside of the patient-centred care plan, the more the care plan (and thus patient problems and goals) is marginalized. If care planning is to be meaningful, the software interface and protocols of use should encourage easy integration of plan elements with clinical management tasks, but should also allow good management of a clinical conversation that emerges outside of the care planning cycle.

The above questions do not have simple answers, and are not well-addressed by absolute or unchanging positions. These are matters for on-going discourse, and for consideration by the Medical Council and Nursing Council, as well as government and the broader academic community. It would seem appropriate for Health Workforce New Zealand to be more actively engaged in NSCPP as it moves forward, both to be aware of the challenges and to look for transformative opportunities.

A further question is one of technical integration. SCP is an information-hungry activity. But copying of records from one system to another is a recipe for out-of-date and inconsistent data. We must rely on selective transcription and periodic data dumps in order to trial SCP. The SCP system is the natural home of the care plan developed in consultation with the patient and of the communications used for coordination among the care team members. But in the longer term SCP will be most broadly feasible, safest and most reliable if its support data derive from (near) real-time feeds of data from interoperable source systems. Other health sector interoperability projects that are under way, particularly those of Patients First (e.g. GP2GP), should soon be exploitable for significantly reducing the burden on end-users to keep data synchronized.

5.2 Recommendations for Phase 2

The following areas require specific consideration as the project moves into Phase 2. These recommendations, in interim form, have been tabled to and discussed with the NSCPP

Steering Group in October 2011. It should be noted that NIHL evaluation team's assessment is very largely in agreement with the 'Phase 1 Criteria – Signoff Considerations' document from healthAlliance.

1. Increase the Design Focus on Intra-team Communication Mechanisms. We believe it is critical that the interaction be redesigned with respect to communication of task assignments and other messages within the care team using CCMS and the subsequent recording of that activity as a record. At present the methods of explicit communication between team members are ambiguous and not adequately tailored to user needs or clinical work flow. Equally, the expectations of participating users to receive and acknowledge communications from other team members are unclear. This creates a situation that undermines the utility of the system, where a team member may make an explicit request of another team member (e.g. to review a patient's medications) with no assurance of effective receipt. With the experience from Phase 1 it should be highly feasible for HSA Global to work with users to create a few key communications use cases and establish clear user-interface functionality and usage expectations for care team members.
2. Embrace the Key Role of Nurses. The majority of CCMS use so far is by nurses, and this is likely to be the continuing trend. While physician engagement is essential, nurse activity will be central to care plan formulation and overall shared care execution. The project should reflect this in terms of increasing the emphasis on input from nurses, including expanding the influence of nurses in the project governance, as well as greater communication of interim results to nurses (e.g. to the Nursing Council). Nurses should feature as the key hands-on users in software interaction re-design. However, as per 1 above, ensuring responsiveness from other users – particularly physicians – is critical.
3. Go for Best-Value Patient Cohorts while we Wait for a More Definite Business Model. Establishing a business model to compensate for care planning activity remains an open issue; however there appears to be room for advancement by focusing on a few specific patient groups. One focus could be the high value patient groups such as renal patients or palliative patients who already take a large enough amount of shared management effort such that care planning is readily accepted as a good use of time. Another valuable focus is where there are large numbers of patients with high frequency of hospital interactions (outpatient and inpatient) such as people with diabetes, COPD and cardiovascular disease. The final group are those services where a shared care plan framework would facilitate an existing process such as Advanced Care Planning. This approach is likely to give a greater depth of patient eligibility with varying levels of communication needs, and with a mixed initiation of enrolment and plan development. Whichever direction is chosen for expansion of the SCP cohort, clarity of recruitment criteria and enrolment protocol is essential since such activities are outside 'business as usual'.
4. Undertake Use-Case Driven User interface Re-design Now. The software solution is still unwieldy for promoting increased uptake. Relatively straightforward improvements in the user interface consistency could contribute to its intuitiveness. User feedback indicates that the care plan aspects of the CCMS user interface are

particularly counterintuitive for viewing, creating or updating. Overall, the system would benefit from use case driven redesign along the lines recommended for task communications as per above. These are superficial software changes from an architectural perspective, but they need to be done systematically through an Interaction Design process with user engagement – they cannot be treated as a 'bug fix'.

5. Initiate a 'Proof of Concept' for the Patient Role. Although a handful of users have been given access to limited CCMS functionality, it must be acknowledged that the role of patients as active users of CCMS has been largely unexplored in Phase 1. The limited promotion and depth of patient-as-user functions to date is disappointing given the underlying philosophy of shared care. It is understandable that the issues as per above have been of sufficient complexity to diminish the appetite and capacity for simultaneously exploring patient use, but this area is now seriously underdeveloped. Consensus must be reached on how and when a patient can post questions to the care team, as well as how patients may exercise other capabilities such as posting goals, notes and observations. These issues, admittedly, conflate with the unresolved overall communication and business model issues. In addition to relatively superficial user interface changes to CCMS, role based security and access models must be implemented. Currently, all people who are part of any care team, including patients, can send a message to anyone, including another patient. This poses a raft of privacy and process issues that will need to be resolved in Phase 2. Nevertheless, Phase 2 must aggressively explore the patient role and push to establish broader experience with patients providing online input into the shared care system. Essentially, we need to revisit the ethos of the Phase 0 'Proof of Concept' but this time with the patients as the key users that are driving the software tailoring and modification process. Like Phase 0, this will need to be an activity spanning a few months and with close interaction of the software vendor, project team and users.
6. Agree on Way of Working with Imperfect Online Medication Lists. As pointed out by healthAlliance, medication lists imported to CCMS often contain past medications that the patient is not currently taking. At the core of this problem is that general practice PMS software has been performing a functional role with medication – to print prescriptions – that is not the same as providing a reference record of current medication. Automated extraction from the PMS database exposes this subtle difference. New Zealand has a well-established culture of GP software use that will need to be steered toward a shared care mentality. It must be accepted that this is more than a simple change in software functionality. While incorrect medication lists pose a safety concern, physicians are accustomed to a lack of reliability in medication records and are innately cautious in this regard. The situation is suboptimal, but we believe it is best tolerated for the time being. Numerous projects are moving to improve the situation (e.g. with respect to better and more structured medication lists on hospital discharge). Share Care Planning should contribute to the demand for more systematic and comprehensive medication data management, but should not be put on hold to wait for it. For Phase 2 there should be agreed protocols for communicating about suspected inaccuracies in medication records of the CCMS and of source systems, notably the GP PMS.

7. Plan for Secondary non-Care Team Use. There is the potential for 'low hanging fruit' in direct health benefits when secondary providers outside of the care team can view the shared care record. The record could provide valuable, even life-saving, context when a patient presents to the Emergency Department or other hospital services. This benefit is unrealised at present because there are simply too few NSCPP patients for knowledge of the record and its mode of access to become an active part of hospital staff awareness. This is one area where simply persisting with scale-up will largely address the issue, if it is complimented by communication updates and some training opportunities for staff as their speciality (i.e. diabetes) has increased primary care enrolments. However, engagement of Orion Health to explore optimal and consistent placement of the shared care data in Concerto will further facilitate benefits in this area. Moreover, Phase 2 should have an explicit plan for how and when to undertake concerted communication to the broader secondary care community about availability of CCMS data, including clear policies for appropriate access.

In the next two sections we expand on our recommendations concerning interaction re-design and areas for expansion of the user base.

5.3 Interaction Re-design

Alan Cooper is known for his Interaction Design process^{38, 50} followed by Apple and Google. A key tenant of this process is to directly involve users in design and not to let priorities of others, including the IT staff or management, distract from a focus on designing a product that fits the user's needs and does so in a fashion that they find appealing and natural. The resulting product should never leave the user feeling 'dumb' (as when one sets off their car alarm by accident or loses three hours work when thinking they saved their document).

An Interaction Design team works with highly realistic user 'personas' (believable, complete sketches of people representative of real users, although not necessarily identical to any one real person) and a selection of use cases (scenarios typifying productive use of the system). The design objective is to have a system that is easy to use – comprehensible, predictable, pleasant and efficient – for the personas as they fulfil their roles in the use cases. The number of use cases considered should be relatively small, representing the most common and critical user interactions with the system.

CCMS for the NSCPP is in need of user interface re-design, around communications within the care team generally, and for care planning in particular. The current set of CCMS features, including Notes (with an option to send notification to the GP), Tasks assigned to users, hierarchically organised Care Plan items (which may be linked to tasks), along with the Messages feature that was disabled early in Phase 1, fail to present an unambiguous and efficient way of working for users undertaking tasks commonly encountered in Phase 1. While the HSA Global team has performed admirably in providing iterative modifications in response to user feedback, and indeed the user interface continues to be adapted based on the latest user feedback, there is a widely held consensus among stakeholders that the user interface could be better fitted to NSCPP activities.

The results from analysis of CCMS transactions reveal problem areas with respect to lack of user understanding of which features to use for which effects. We can see specific problems of redundancy in user entries which are not entirely eliminated by the removal of the Message feature (e.g. with redundancy between Task and Note content). We also see considerable use of Notes feature for content that closely related to (and perhaps better recorded as) Task assignment. The road to improved interaction efficiency may involve assurance that the record of Tasks is an archival part of the record, or that the tasks are directly linked to the Notes. The prevalence of apparently meaningless care plan template fragments among the care plan elements is indicative of user difficulties with this area of CCMS function. User feedback also indicates concern with the usability of the care planning functions, as well as the need to address simple user interface consistency issues (e.g. mixture of scrolling and paging).

We recommend use of Cooper-style Interaction Design as the process to arrive at the revised user interface and associated user protocols and training (note that an interface being 'usable' does not mean that it requires no training – think of air traffic controllers: one expects that their system interface is usable, but also hopes that they are trained!). Revised user protocols and training must ensure timely response to SCP-related communications and provide other protocols for appropriate actions by care team members (e.g. to follow-up and correct inaccurate medication data).

In terms of user involvement, we find that each of the three pilot projects (one per DHB, all of which were fully engaged in Phase 1 implementation) has one nurse (variably situated in community or hospital) who has created a high percentage of the total communication. Such an individual we may term a 'lead nurse' – and they are key candidates to engage as part of the Interaction Design team. Other representatives of community, allied and secondary services could engage to provide periodic feedback. We believe the patient portal needs its own exploratory proof-of-concept phase for initial development.

Identification of the key use cases warrants broader input and will then require detailed development. Based on our analysis, however, we suggest the following three areas for use case development:

1. A lead nurse wishes to assign a number of tasks to himself/herself and to others. It is critical that the nurse have confidence that the other providers are aware of the task assignment in a timely manner and that an appropriate acknowledgement is posted when the provider has actioned the task (completing it, or perhaps modifying it – e.g. recommending a different course of action, transferring the task to another or indicating a reason for delay). The acknowledgement must include or reference sufficient details to document the action taken for ongoing management of the patient. Moreover, intrinsic to successful task assignment, the tasked providers must have sufficient information to understand the motivation for the task and act appropriately. And, as in all common use cases, the effort required on all parties must be minimised and not exceed what is feasible in the context of provider workflow.
2. A care plan is produced by a provider in consultation with a patient. The user may or may not be a lead nurse. It is critical that it easy to create the hierarchy of plan elements – problems, goals, and tasks related to these. The task expectations created in this session must be clearly understood by those tasked and amenable to effective

management as per Use Case 1 above. Care plan creation should automatically schedule an appropriately timed care plan review.

3. An emergent medical problem is managed. This case starts with a concerning development in the patient's condition, which may be detected in any care setting (initial indications may be phoned in by the patient or a relative, and in future may be logged to the CCMS portal by such individuals). Subsequent management involves input from multiple members of the care team, typically from both community and secondary settings. The agreed course of action requires follow-up; while there will be pre-planned contingencies, it may require subsequent further communications amongst the care team members to stabilize the situation.

Analysis of system use from Phase 1 (as per the findings of this report) should serve to inform the choice of use cases and exemplify typical care plan and other clinical communications content.

The scenarios portrayed in use cases for Interaction Design must be thoroughly realistic in terms of the context of use (e.g. time constraints, place of system use and other factors competing for the user's attention). For SCP, this means that each use case must involve a realistic patient (even though the patient is not a hands-on user for this part of the re-design activity). Cooper recommends that each persona have a name ('Nurse Janice', etc.) – in fact, he recommends that each persona have an associated photo and that the design team pin them up in their workplace. For SCP, a logical extension of Cooper's method is to have a name and photo for one or more realistic patients as well.

While the nurse will be the most central hands-on user, the design of the use cases must encompass the essential role of physicians. Aspects of the use cases should reflect face-to-face communications happening in the primary and secondary settings. It is of critical importance that the design fits physician workflow to ensure timely input, based on concisely-presented and clearly-understood information, in response to communications initiated by the nurse (and, in the Patient Proof-of-Concept phase, for the patient). Indeed, the dominance of nurse use in Phase 1 could be interpreted as emphasizing the need to find better modes for physician interaction.

The scope of the use cases (and associated personas) should also extend to other user types for which greater participation is desired, such as pharmacists and occupational therapists.

5.4 Expansion of the User Base

The fundamental characteristic of Phase 2 is to extend the use of CCMS-enabled SCP. As per the recommendations above, establishing a business model to compensate for care planning activity remains an open issue. To work within this limitation, SCP should be applied to patient cohorts that provide a strong value proposition within current health delivery frameworks. It will be essential in this next phase to grow patient numbers substantively so as the shared care work flows and learning's can truly be tested.

Key condition based cohorts to consider for Phase 2 include:

1. Renal and/or palliative patients who have a high degree of contact with the practice already and thus should represent a relatively easy proposition in terms of investing the effort for care planning and adopting IT support for the communications among the care team members.
2. People with diabetes, COPD and cardiovascular disease – representing relatively straightforward extensions of methods from the heart failure, airways and gout pilot groups in Phase 1
3. Services where a shared care plan framework would facilitate an existing process such as Advanced Care Planning, with potential to integrate with other sector initiatives, notably those of GAIHN.

Recruiting additional secondary services within the three participating DHBs will increase the breadth of involvement in the secondary settings. This will make it more feasible for there to be general awareness of Concerto access to CCMS data and will increase the percentage of total caseload from each participating general practice that is eligible for SCP.

In terms of further general practice recruitment, it should be considered that most of the participating general practices have a relatively low degree of internal penetration of CCMS user, usually centred on a single participating GP. It would be a good demonstration of the acceptability of the tool and model if more of the GPs within the participating practices could be induced to join the trial. Moreover, this would increase the user base with minimal increased logistical cost for the project team.

Whichever direction is chosen for expansion of the SCP cohort, clarity of recruitment criteria and enrolment protocol is essential. NSCPP is proceeding ahead of any formal deeper transformation in roles and responsibilities for providers. Care planning requires significant real work, with the benefits often falling to different teams and organisations than those making the effort. Since these activities are outside of 'business as usual', provider teams participating in Phase 2 must be clear about what is expected from them, including how to identify candidate patients, how to initiate them into the programme (informed consent, logging of the patient and their care team with the system, and initial care planning) and ongoing expectations (e.g. with respect to read notes and task assignments, as well as how to address future patient contributions to the record).

Training/induction materials must be tailored for conveying the expectations that are placed on these new user groups. For Phase 2 to truly succeed in being 'Wider Deployment', the user base should be moving out from early adopters. As such, there must be a clearer message for the prospective users to address WIFM ("What's in it for me?"). In association with the training materials, there will need to be an appropriate capability to deliver training and associated change management support. Users from Phase 1 may have a role to play in providing clinical leadership and conveying messages from those who have experience with the model.

5.5 Evaluation Plan for Phase 2

We recommend the several streams of evaluation activity through Phase 2. In chronological order of commencement these are:

1. Evaluation of Interaction Re-design. This would start with observation of the use-case driven Interaction Design sessions and associated revisions of user protocols and training. The redesign will culminate in a revised CCMS user interface and associated training materials. The evaluation team should continue to collect user feedback regarding usability of the system throughout Phase 2.
2. Evaluation of "Proof-of-Concept" for Patients. The experience of patients as CCMS users must be more fully enabled. Working closely with the software vendor, patients will be the key drivers of the requirements. Providers, however, must be kept in-the-loop to ensure the interactions are feasible and acceptable within their workflow and constraints. This will be a highly exploratory and adaptive activity where ongoing evaluation will work in a tight feedback loop with the other participants, particularly the software vendor.
3. Measuring non-Care Team Secondary Access. As recommended, a plan should be enacted to ramp up secondary access to CCMS by secondary staff who are not members of the care team, such as ED staff encountered enrolled patients. The evaluation should include quantitative tracking of the rate of CCMS record views by such users over time to establish that an increase is achieved, as well as a qualitative arm based on interviews of non-care team secondary users to establish how well the CCMS data is meeting their requirements.
4. Review of provider role and responsibility transformations. SCP goes beyond 'business as usual'. Participant interviews should continue to probe how users are doing things differently than they would with respect to similar patients under 'usual care'. The areas where new activity is providing improved care, particularly improved care that may benefit teams and organisations other than those directly engaged in the activity (e.g. as with a general practice care plan reducing hospitalisation risk), will provide guidance for formulation of new job descriptions and reward schemes, as well as informing future cost-benefit models of SCP.
5. Re-visiting Baseline Measures on Patients and Provider Organisations. Because of the short duration of engagement for most patients, and limited organisational penetration of SCP for most participating provider facilities, the evaluation team deemed it unfruitful to conduct a second administration of the patient (PACIC⁴³, PIH⁴⁴ and Morisky⁴⁵) and provider facility (ACIC⁴⁶) questionnaires measuring depth of chronic condition management within Phase 1. At this point, however, substantial cohorts of patients and practices have now had baseline assessment on these internationally-recognised scales. These specific patients and practices should (if they consent) be reassessed at the end of Phase 2, thus providing quantitative measures of process improvement based on around 9 months of SCP experience.

6. Case Review by Expert Panel. SCP should lead to improved adherence to evidence based guidelines for appropriate management of patients' long-term conditions. It is recommended that an expert panel of individuals, including specialist and GP physicians and not previously involved in any of the CCMS-based care delivery in Phases 0-2, review a selection of cases from among the enrolled patients managed in Phase 2. For each case the panel would provide a critique working from the CCMS interface (and possibly with access to Concerto as well, to simulate the information available to a hospital based specialist). Panel assessment would indicate areas where the management was in accordance with best practice, where it was at variance, and areas where the panel could not tell based on the data available. These assessments would serve to guide further refinement of the interface, to better articulate strengths and weaknesses of the model, and to inform the panel members as potential exponents (or critics, if appropriate) of the model.

These analyses will be underpinned by continued quantitative tracking of the rate and pattern of CCMS usage to establish uptake across provider roles and sites, as well as by patients.

The above evaluation activities should be performed under a new research ethics protocol approved by the Northern X or Y ethics committees.

It is anticipated that operational arrangements for evaluation activities will be similar to those in Phases 0 and 1, where the evaluation team works closely with the other stakeholders, including the vendor and the ongoing 'project' as operated by health Alliance. The evaluation team would arrange activities that exist purely for evaluation purposes, such as user interviews and the expert panel for case review.

The Patient 'Proof-of-Concept' activity stream would be fundamentally part of the 'project' for Phase 2; although it will have an exceptional degree of iterative evaluator input, there will be overall project management and systems management issues such as integration of the new functionality into the midstream operation of Phase 2.

It should be noted that these recommended evaluation activities do not include health economic analysis. Such analysis could build on the observations of role and responsibility transformations and other usage patterns to extrapolate costs and benefits of SCP under specific assumptions.

Recommended Timing

Table 21 outlines the recommended timing of activities for Phase 2 proposed above. It is assumed that the current Phase 1 pilots (heart failure, gout, COPD and Diabetes) will continue to operate with the enrolled patients and that Phase 2 will run from November 2011 to 30 June 2012. Note that we do not recommend any new patient enrolment until February 2012.

Table 21. Recommended timing for Phase 2 activities

Activity	Start – End	Notes
Interaction re-design	Nov 2011 – Feb 2012	Use case based re-design with Interaction Design approach to begin as soon as possible
Revised user protocols and training	Nov 2011 – Feb 2012	In concert with Interaction Design
Patient Proof of Concept	Jan 2012 – Apr 2012	Resultant software revisions to follow after completion of incorporation of changes from interaction re-design process
Expanded SCP scope	From Feb 2012	Stakeholders in additional pilot areas (e.g. renal failure) to be identified and recruited as soon as possible, but to begin trial use only upon completion of interaction re-design
Questionnaire re-administration	Jun 2012	Updated measures on Phase 1 participants for which baseline measures have been acquired
Expert panel case review	Jun 2012	Review of a sample of cases; panel membership to include external experts appropriate to pilot area (e.g. gout, heart failure)

5.6 Study Limitations

This study has a number of inherent limitations. Most notably, there is no basis for direct measurement of SCP contribution to outcomes such as improved health status or cost benefits. The recruitment method offers no clear opportunity to construct a control group in that: (a) the providers are volunteers and are likely to be a biased representation of the provider population; and (b) the patients are selected by the providers with biases both in terms of their need for SCP and their appropriateness for such management. Moreover, participants are, of course, not blind to the fact that they are participating in a trial of SCP. In the long run, if a region is saturated with use of SCP, it would be feasible to compare the outcome of specific patient cohorts in that region to the same region at an earlier time and/or to other regions, controlling for patient and provider variables. In the near term, the most accessible measures are related to the process of care – engagement of clinicians in online conversations about patient care tasks and management of medications is a good sign that the programme is creating a communications medium amenable to the promotion of evidence based care.

A further serious limitation relates to the short duration of SCP activity so far. As patient enrolment and initial care planning has proceeded in Phase 1, most patients have experienced less than 3 months of exposure to management in the new model. Usual care for chronic conditions in New Zealand tends to run with scheduled appointments on 90 day intervals. While some of the ability to use CCMS to communication and coordinate around exacerbations of conditions has been demonstrated, the trial duration has been too short to reach to even a single 'normal' return visit for the majority of patients. For this reason, and due to the lack of

completeness of uptake of SCP among the staff of many of the participating general practices, the evaluation team deemed it too soon to meaningfully re-administer the standardised questionnaires (PACIC, Morisky, Flinders and ACIC).

The latter activities of the recommended Phase 2 evaluation plan above move in the direction of firmer indicators of improved care processes, allowing more quantification of process improvement over a longer timeframe of SCP exposure.

5.7 Dissemination

The present report, after accommodation of stakeholder feedback, is to be made publically available. This should be done using a Web 2.0 format that invites public comment and continuing dialogue, such as the Health Innovation Exchange (HIVE, <http://www.hive.org.nz>).

Select elements of the findings will be prepared for academic peer-review and, if found to be of sufficient interest and quality, publication in academic conference proceedings (with associated face-to-face presentations) and/or with scholarly journals.

5.8 Summary

Phases 0 and 1 should be regarded as having been extremely valuable for providing a wealth of insights into electronically mediated shared care planning for New Zealand. There were rich and productive interactions among the software vendor team, project team and user community (and, indeed, the NIHI evaluators) throughout the months of the trial.

Phase 0 provided clear benefits in terms of efficient early identification of technical barriers and identification of training/induction requirements for Phase 1. This staged approach should be considered as a model for other projects involving highly innovative and potentially transformational use of IT.

In addition to the explicit learning about SCP, the exercise has provided capacity building through experience and interaction, particularly in terms of the dozens of providers, and nearly 100 patients, who have been exposed to the experience of IT-enabled SCP. They will now be much more sophisticated consumers of future offerings and provide a widened base of potential trainers and advocates for subsequent phase of NSCPP or related programmes.

Phases 0 and 1 have achieved their basic objectives of achieving an IT-enabled SCP method into which a substantial number of patients have been enrolled and undergone care planning. That said, the success is marginal in a number of areas, with room for improvement particularly in terms of fit of the software interaction to common communications needs amongst providers and in terms of identifying a workable proof-of-concept for patients as active online users. Also, the central role of nurses as key users should be more fully acknowledged in terms of project emphasis, including governance and reporting.

In terms of the assessment framework domains, we find the following:

- **Health Outcomes.** We have found perception of improved patient motivation and overall health service experience through goal setting and shared information. Primary and secondary team members are able to use CCMS to set tasks for one another and communicate about patient status and management plans. Moreover, the process of SCP encourages improvement of health record quality (e.g. in terms of medication and problem lists). There is also the potential for SCP record access by providers outside of the direct care team.
- **Social.** There is strong in-principle support for shared care, although it is often difficult to fit to practice workflow. There is the challenge of staff having time, and skills, for shared care planning. Moreover, there is a need to better define modes for patient participation and for change management support overall.
- **Technology.** The software is feasible to use for conversations around coordination of care, but requires use-case based re-design of the user interface and clearer expectations of users
- **Economic.** Review of existing funding models is required to accommodate the 'work' of SCP. A key challenge is that savings will often come to different group than those making the major shared care effort

Phase 2 should commence with a period of redesign on the software interface and associated clarification of protocols for care team members, particularly around timely receipt of SCP-related communications and procedures for follow-up of incomplete or incorrect medication data. In parallel, new providers can be recruited for a controlled scale-up of the user base. As Phase 2 scale-up ensues, there must be a concerted work stream to develop and refine the patient user interface to CCMS in a manner that suits both the patients and their providers (Patient Proof-of-Concept). Evaluation activities should assess the success of the re-design and ongoing Patient Proof-of-Concept, and look for secondary access by non-care team members, as well as reviewing how provider roles and responsibilities are being transformed. The evaluation of Phase 2 should conclude with examining changes in standardised scores of patients and provider organisations measured in Phase 1 as well as a panel assessment of the quality of management of a selection of cases.

Appendix A: Literature Review

Abstract

Purpose: To deliver greater clarity on the chronic care management literature that is relevant to shared care planning (SCP) in support of the national shared care planning programme (NSCPP).

Methods: NSCPP project documents, including evaluation proposals, were firstly reviewed. Backward literature search on the references used in the project documents was then performed. Significant models, initiatives, and approaches (by searching PubMed with keywords such as “shared care model”, “chronic care model”, or “shared care planning”) were added in the review, if they had not come up in earlier search. In total, more than 100 relevant articles/reports were reviewed and 95 are included in this review.

Findings: A number of international initiatives relevant to shared care planning have been established in order to improve patient’s health outcomes. The process and approach taken by these programmes vary according to the models applied, which often emphasize either shared care or care planning. The concept of “shared care” has synergies with terms such as “co-ordinated care”, “collaborative care” and “integrated care.” And a care plan defines problems, goals, actions, time frames and accountability of all involved. The benefits and barriers of shared care planning have been reported in literature using a range of terminology and measures with various understandings regarding the shared care records. A few potential benefits of shared care planning activities include improved communication, improved quality of care and increased patient involvements.

Background

The New Zealand National Shared Care Plan Programme (NSCPP) is at the core of the government’s strategy for using technology as an enabler to deliver health outcomes that:

- Deliver connected care to patients, particularly benefitting those with long-term and chronic conditions
- Enable more active involvement of patients and their families in their planning of care
- Improve the efficiency and effectiveness of the health system

In parallel to the NSCPP pilots that will provide the first implementation experience of shared care planning (SCP) being widely adopted in New Zealand, an evaluation project will seek to measure the success of the trial in reaching its objectives and identify the barriers and critical success factors that would need to be addressed if and when there are wider deployments of the approach. This literature review is performed to deliver greater clarity on SCP literature for the NSCPP evaluation study.

Motivation for shared care planning comes from recognition of issues such as errors,^{13, 21} duplicated tests,⁵¹ as well as demands of increased rates of chronic illness and aging population.^{5, 52-55} A 2011 survey in eleven high-income countries (Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States) concluded that in all of these countries, patient care is often poorly coordinated, for instance, with gaps related to medical records or tests, or communication failures between providers.⁵⁶

The United Kingdom (UK) Management Executive has called for the promotion of shared care since early 90s.⁵⁷ The UK Department of Health 2009 report of "Impact assessment for implementing personalised care planning for people with long-term conditions (including guidance to NHS and social care)"³ summarized the existing evidence base for care planning into ten categories regarding 1) cost, 2) emergency attendances, 3) inpatient days, 4) quality-of-life, 5) confidence in being able to cope with condition, 6) knowledge about the condition, 7) treatment satisfaction, 8) health outcomes, 9) use of medication and 10) the views of patients and health professionals.

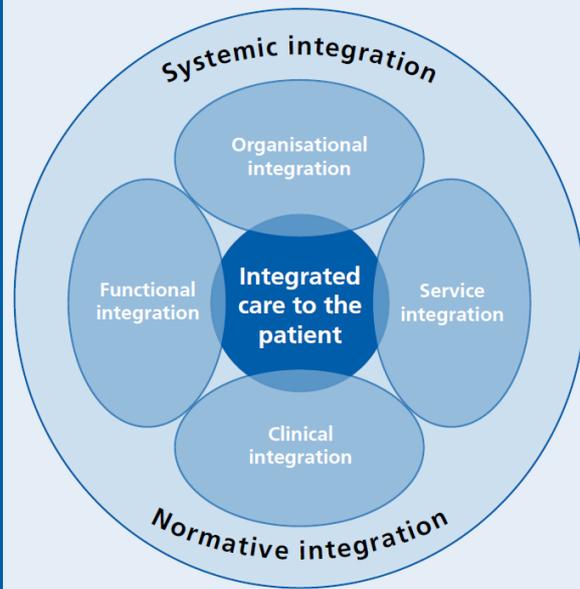
International initiatives such as this and their underlying shared care models are reviewed to inform the NSCPP implementation. Their experience may have useful indications and implications for the New Zealand approach, in terms of the processes taken, the benefits achieved, the barriers perceived and the terminology used. Each of these topics will be discussed in turn at the following sections.

Process/Approach

UK: integrated care and care planning

The UK Department of Health 2009 report suggests that everyone with a long term condition should be offered an "integrated care plan", which should be developed, agreed and regularly reviewed with a named lead health care professional from the care team.³ General practice is seen to be playing a pivotal role as part of this shared care model.⁵¹ One SCP implementation is the 16 national integrated care pilots, which have identified a key ingredient for integrated care as "some form of commissioning, led by clinicians and based on a registered population delivering primary care."⁵ This approach emphasizes integration on multiple layers including organisational, functional, service, clinical, normative and systemic integration, see also FIGURE 1.^{5 4}

FIGURE 1: TYPOLOGIES OF INTEGRATED CARE



Source: adapted from Fulop and others (2005)

- Organisational integration, where organisations are brought together formally by mergers or through 'collectives' and/or virtually through coordinated provider networks or via contracts between separate organisations brokered by a purchaser.
- Functional integration, where non-clinical support and back-office functions are integrated, such as electronic patient records.
- Service integration, where different clinical services provided are integrated at an organisational level, such as through teams of multi-disciplinary professionals.
- Clinical integration, where care by professionals and providers to patients is integrated into a single or coherent process within and/or across professions, such as through use of shared guidelines and protocols.
- Normative integration, where an ethos of shared values and commitment to coordinating work enables trust and collaboration in delivering healthcare.
- Systemic integration, where there is coherence of rules and policies at all organisational levels. This is sometimes termed an 'integrated delivery system'.

The United States (US): patient-centered medical home

The patient-centered medical home (PCMH) is an approach aiming to provide comprehensive primary care. It is a health care setting that facilitates partnerships between patient and their physician, and when appropriate, the patient's family^{58, 59}. A number of studies reported (potential) improvement in access and quality of care based on the experience of implementing and/or evaluating PCMH, such as⁶⁻¹³. Table 1¹¹ summarizes the design principle and change components of PCMH, at the core of which is the relationship between primary care physician and patient.

■ **Table 1. Patient-Centered Medical Home Design Principles and Change Components**

PCMH Design Principles	
1. The relationship between the primary care physician and patient is at the core. The organization will align to promote and sustain this relationship.	
2. The primary care physician will be the leader of the clinical team, be responsible for coordination of services, and will collaborate with patients in care planning.	
3. Continuous healing relationships will be proactive and encompass all aspects of health and illness. Patients will be actively informed and encouraged to participate.	
4. Access will be centered on patients' needs, be available by various modes 24/7, and maximize the use of technology.	
5. Clinical and business systems will align to achieve the most efficient, satisfying, and effective patient experiences.	
Change Components^a	
Structural and Team Changes	
Smaller physician rosters	Longer standard visits time
Physician/medical assistant pairing	Automated phone call routing system
Team member colocation	Dedicated "desktop medicine" time
Point-of-Care Changes	
Communication of team roles to patients	Motivational interviewing techniques
Promotion of e-mail and phone visits	EMR "best practice alerts"
Previsit chart review and visit planning	EMR "health maintenance reminders"
Real-time specialist consulting via EMR	Promotion of patient Web portal functions
Collaborative care planning	Redirect consulting nurse calls to team
Patient Outreach Changes	
New patient outreach	Mailed "birthday reminder" care letters
Emergency visit and inpatient follow-up	Abnormal test outreach
Chronic disease medication outreach	Promotion of e-HRA
Outreach using care deficiency reports	Promotion of self-management workshops
Group visit outreach	
Management Changes	
Daily care team huddles	Rapid process improvement cycles
Visual reporting system to track changes	Salary-only physician compensation
PCMH indicates patient-centered medical home; e-HRA, electronic health risk assessment; EMR, electronic medical record. ^a See Appendix A for further details.	

US Stanford model: CDSMP – education program

The Chronic Disease Self-Management Program (CDSMP) is a self-management education course for chronic disease patients. It is low-cost, community-based and peer-led.⁶⁰ The topics covered in the CDSMP include exercise, nutrition, medication and decision-making. The content of CDSMP course has been published in *Living a Healthy Life with Chronic Conditions*.⁶¹ It is designed to meet the needs of chronic disease patients such as heart disease and arthritis.⁵⁵ It has been proved feasible and beneficial to improve health status and to decrease hospitalization and health care costs.^{55, 60}

US Wagner's CCM model and collaborative care

E.H. Wagner's Chronic Care Model (CCM)¹⁹ is a proven model to guide quality improvement⁵³ and practice redesign;⁶² its components being properties of health systems or of individual practitioners.⁶³ CCM emphasises "productive interactions" between a proactive clinical care team and the supported, motivated, informed patient in their community context.¹⁹ Evidence shows that collaborative CCM interventions have lowered cardiovascular disease risk factors

for diabetes patients.²⁰ Such collaborative care includes components at patient-, provider-, as well as system-level.²³

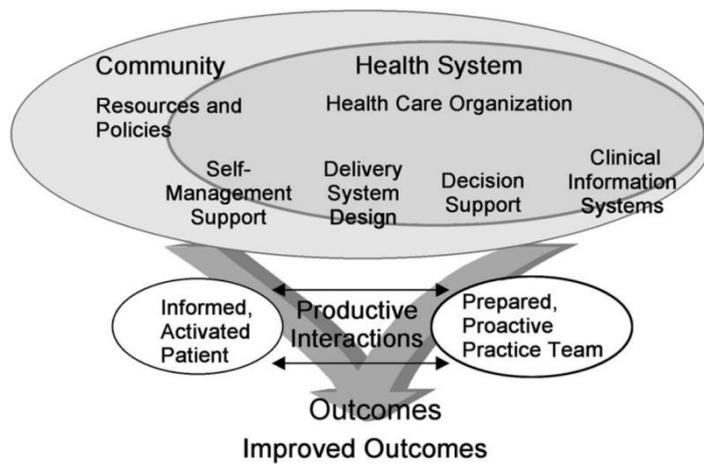


FIGURE 2. CCM^{53 63}

On the other hand, evidence for quality improvement collaborative is limited, with positive and only modest effects on outcomes.⁶⁴ There are validated instruments such as the **Assessment of Chronic Illness Care (ACIC)**⁴⁶ for measuring chronic illness care quality-improvement efforts, tracking progress over time^{46, 65} and assessing the extent to which patient care is congruent with CCM.⁶⁶ The **Patient Assessment of Chronic Illness Care (PACIC)** was designed to complement the ACIC tool by providing a patient perspective on receipt end of CCM based chronic care.⁴³ PACIC is also a validated instrument used in many countries.⁶⁷⁻⁷⁰ Both instruments are used in the current NSCPP evaluation.

Australia: Flinders Programme – self-management care plan

Applying Wagner's CCM¹⁹ framework, Australian Flinders Programme suggested a self-management care plan to be collaboratively developed with health professionals and other supports (including carers).²⁷ This care plan should contain patient-defined problems and goals, medical management, action plan, community education programs, resources and support networks, review time and follow-up.

In developing this plan, the patient partners with their health care provider, they actively participate in decision-making with their doctor, they are supported to learn new skills and confidence to self-manage, they build knowledge about their health and long term condition(s), and they learn to monitor changes and improvements as well as symptom recognition.²⁷ The South Australian HealthPlus successfully implemented Flinders model with improved health outcomes; however, savings were not sufficient to pay for all the coordination costs.¹⁵ An audit of 230 type 2 diabetes patients' medical records in southwest Sydney shows improvement in guideline adherence, metabolic control and cardiovascular risk factors, following the implementation of multidisciplinary care plans.⁷¹ A 2008 study concluded that developments in care planning in Australia, e.g., the Medicare payments for it, can assist GPs in patient care, which subsequently can result in improved system organisation and self management.⁷²

Learning from the approaches taken internationally that concentrated on either shared care ('collaborative care' or 'integrated care', e.g. in the UK and US) or care planning (e.g. in the UK and Australia), shared care planning has shown promising benefits in chronic disease management.

Evidence for SCP benefits

Chomik¹⁷ reviewed shared care projects in British Columbia for managing a range of chronic conditions and summarised their benefits and challenges as per Table 2.

Table 2. Chomik's (2005)¹⁷ summary of potential benefits and challenges of shared care

Benefits	Challenges
Reduced fragmentation of care; i.e., a better integrated, more continuous system of care.	Power and status differences between health care providers (e.g. between nurses and GPs or GPs and medical specialists).
More efficient use of resources and cost efficiencies.	Professional territorialism and perceived threat to professional autonomy and/or scope of practice.
Strengthened links between primary, secondary and tertiary sectors.	Current funding arrangements that require GP to see each patient in order to receive service payment/reimbursement.
Improved working relationships between providers.	Time and personnel to implement and manage shared care.
Improved satisfaction among patients and providers.	Limited methods to measure outcomes.
Increased patient access to care	

SCP has also been reported to improve communication between hospitals and care homes while developing and implementing a user-led daily living plan with older people.²⁴ A 2005 randomized controlled clinical trial in Western Australia indicated that the hospital-coordinated discharge care plan improves quality of life, discharge planning involvement, and satisfaction with discharge care, and hospital-GP integration.¹⁶ Managed integrated care supports GPs and consultants work together on the care pathway and re-aligns work from secondary to primary care.⁴

A 2008 systematic review on shared care across the primary-specialty interface was guarded though, at least about the consistency of benefits in chronic disease management. The review identified 20 studies (19 being randomized controlled trials). They found "no consistent improvements in physical or mental health outcomes, psychosocial outcomes, hospital admissions, default or participation rates, recording of risk factors, and satisfaction with treatment."²¹

Patient engagement in their health care

Decreased use of health care services and lower charges are associated with patient-centered care – measured by Mead and Bower's (2000)⁷³ five key aspects of the doctor-patient interaction in a patient-centered approach.⁷⁴ A 2002 review of disease management

programmes found that patient education was the most commonly used intervention (92/118 programmes) which can lead to improvements in patient disease control.⁷⁵ It is suggested that the ongoing relationship with patient at the centre of their own care plan should focus on learning about their needs, such as life and health goals, past treatment experiences and preferences, as well as their strengths, resources and barriers.²⁵

Coulter and Ellins (2007) reviewed initiatives that aim to engage patients in their own or their family's individual clinical care, and summarized the patient focused quality interventions into four approaches,⁷⁶ as per Table 3:

Table 3. Patient focused quality interventions

Aim	Interventions	Evidence
To improve health literacy	Provision of printed leaflets and health information packages Provision of computer/internet based health information Targeted approaches to tackle low levels of health literacy in disadvantaged groups Targeted mass media campaigns	Improve knowledge and health behaviour; but few have reduced inequalities in health status. ⁷⁷
To improve clinical decision making	Patient decision aids Training for clinicians in communication skills Coaching and question prompts for patients	Improve knowledge and understanding of condition, treatment options and outcome probabilities; improve agreement between patients' preferences and subsequent treatment decisions. ⁷⁸
To improve self care	Self management education Self monitoring and self administered treatment Self help groups and peer support Patient access to personal medical information Patient centred telecare	Patient held records can enhance patients' knowledge and sense of control, ⁷⁹ involve patients in their care and improve communication between carers. ⁸⁰ Self monitoring supported by remote telemonitoring can be effective and cost effective. ⁸¹
To improve patient safety	Information to help choose safe providers Patient involvement in infection control Encouraging adherence to treatment regimens Checking records and care processes Patient reporting of adverse drug events	The most effective strategies for improving adherence to treatment involve simplifying dosing regimens. ⁸² Encouraging patients to ask if their health workers have washed hands can improve hygiene. ⁸³

Cost-benefit evidence

Summarized in the UK Department of Health 2009 report, the evidence for economic benefits of care planning includes fewer inpatient days, cost saving, fewer emergency attendances, and adherence to medication use.³ Custom care planning by nurses, primary care physician and specialists was linked to the decrease of inpatient admissions by 20%, inpatient days falling by 28%, an decrease of expense per patient per month by 12%, as well as a net annualized financial impact of 5.6% decrease in total delivery system medical expenditures.⁸⁴

Grampian asthma study of integrated care was reported with saving for hospital (3.06 pound per patient per year), for GPs (2.41 pound per patient per year) and for patients themselves (39.52 pound per year).⁸⁵ Other asthma collaborative care programs reported less emergency room attending rate,^{86, 87} a vast decrease in asthma health care charges⁸⁶ and significantly lower use of inhaled b2-agonist.⁸⁷

Collaborative care for depression can increase treating costs because of the extra visits, but with a modest cost offset due to reduced use of specialty mental health services.⁸⁸ Another study found that better coordination and communication under collaborative care intervention for depression result in a greater number of patients being treated with moderate increases in depression-free days and in treatment cost.⁸⁹

Hospital-based care management model on disabled elderly people in Taiwan resulted in a decrease in medical care expenditure.⁹⁰ On the other hand, Evercare case management of frail elderly people introduced additional services into primary care yet has not reduced hospital admissions.⁹¹

Combining telehealth and care coordination, the US Veterans Health Administration's national home telehealth program reported a 25% reduction in bed days, 19% reduction in hospital admissions at a cost of \$1,600 per patient per annum.⁹²

A review of English NHS (National Health Service) chronic care policies categorized the achievements of its major initiatives into self-management, disease management and case management groups, as shown in Table 4, and recommended to act on several fronts simultaneously.⁹³

Table 4. Result of chronic care initiatives

Initiative Categories	Results
Self-management	<ul style="list-style-type: none"> In Expert Patient Programme: Great self-efficacy and energy. But has not reduced the use of health services, as measured by visits to family physicians and hospital use.⁹⁴ In a random controlled trial with a patient centred approach to inflammatory bowel disease management: Following a written self management plan, patients made fewer hospital visits and no increase in the number of primary care visits.⁹⁵

Initiative Categories	Results
Disease management through new pay-for-performance contract	<p>Acceleration of long-term improvements in chronic care by reducing variations in performance.</p> <p>But annual expenditure on family physicians has increased from 5.1 to 7.7 billion pounds.⁹⁶</p>
Case management	<ul style="list-style-type: none"> • In Evercare pilots: <p>No significant impact on rates of emergency hospital admission, bed days, or mortality among high-risk patients.⁹¹</p> <ul style="list-style-type: none"> • In “virtual wards” by community matrons project: <p>Although emergency admissions continued to rise, lengths-of-stay fell reducing the use of emergency bed-day by 5%.⁹⁷</p> <p>Another review found local variation in its implementation, scepticism about programme value and resistance to ‘bolt on’ nursing roles in primary care⁹⁸.</p>

Barriers

Barriers for implementing shared decision-making in clinical practice that are frequently reported by physicians include time constraints, lack of applicability due to patient characteristics and lack of applicability due to the clinical situation; facilitators, on the other hand, include provider motivation, positive impact on the clinical process and patient outcomes.⁹⁹ Family physicians generally view chronic illness management from a biomedical perspective; only a few view systematic care planning as a new approach; and the strategy is often difficult to implement within the existing organizational and financial constraints.¹⁰⁰

Potential risks for integrated care include: 1) the workforce not having the skills to deliver care planning, 2) care planning is sporadic, creating inequities of services, 3) a lack of evidence for impact and benefits will hinder implementation, 4) initial funding for care planning is not provided.³ Many GPs view integrated care as ‘a step too far’ because they are content to offer face-to-face clinical services rather than take on the responsibilities and risks of a commissioner-provider organisation.⁵

Existing technologies in hospital cardiology wards are found to have failed to identify numerous individuals involved in patient care, indicating improvements to electronic health records (EHRs) tools are needed to foster greater collaboration among care teams and reduce communication-related risks to patient safety.¹⁰¹

A systematic literature review has suggested that implementing multidisciplinary care planning requires changes of interaction patterns between care providers, alignment of roles and work practices, as well as changes to organisational arrangements.¹⁰² To further complicate that, concerns have been raised that nurses may not be the best professionals to carry out chronic disease management as currently understood.¹⁰³

Terminology

A number of terms relevant to shared care planning surfaced in this review, including shared decision-making, integrated care, collaborative care, care plan, care planning, shared care and shared care record. This section discusses the definition of each term and the interaction among them.

Shared decision-making, as between doctor and patient, comprises three main stages: 1) the doctor and patient act in a partnership and share information about evidence and preferences; 2) they talk through this information and discuss the relevant issues; 3) a decision is reached that is informed by evidence, matches the patient's preferences and values, and that ideally both parties agree upon.¹⁰⁴ **Integrated care** programmes that implement shared decision-making are reported to have positive effects on the quality of care.¹⁰⁵ A common objective of integrated care is to reduce fragmentation and increase continuity/co-ordination of care.²²

Based on Wagner's chronic illness model, **Collaborative care** includes components at patient, provider and system levels, where multidisciplinary primary care teams assist primary care provider in delivering evidence-based treatment.²³

A personalised and integrated **care plan** is developed with a named lead professional from among the care team.³ Flinders Programme defines this care plan as a structured, comprehensive plan consisting of problems, goals, actions, time frames and accountability of all involved (e.g. patient, their significant others and carers); and collaborative **care planning** is the process of planning and decision-making surrounding what patient care involves over a given time period.²⁶ Care planning is a means to improve quality of care and provide structure to care process.^{24, 106, 107}

Another definition of **health care plan** is the "planned health care activities bundles encompassing all foreseen health care provider activities to be performed by one health care professional, or by several health care professionals having the same health care professional entitlement."¹⁰⁸ Its UML representation is as per FIGURE 3.

UML representation:

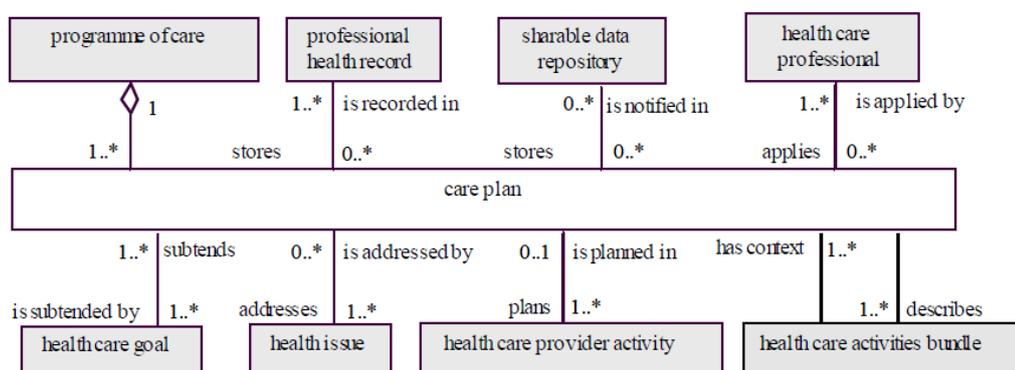


FIGURE 3. Care plan UML¹⁰⁸

Two types of computerized care plans are found¹⁰⁹ – 1) discharge plans when patients are transferred from in-hospital to primary care²⁴ and 2) standard care plans for short term

specialist care or chronic disease management.¹¹⁰⁻¹¹² Tools that support shared care planning, for instance, by providing access to planned interventions for multiple provider organizations and to self care interventions for patients and family carers, are reported to have the potential to improve collaboration and overview of the care process in areas such as shared homecare of elderly patients.¹⁰⁹

Shared care

Shared care is “an approach to care which uses the skills and knowledge of a range of health professionals who share joint responsibility in relation to an individual’s care.”¹¹⁸ This implies the monitoring and exchanging of patient data, as well as the sharing of skills and knowledge between disciplines.¹⁷ As compared to this wider view of shared care, Hickman et al. (1994)⁵² focused on GPs and specialists and defined six classifications of shared care models depending on the mode of information exchange, including routine discharge and referral letters.

A third definition of shared care was found by Chomik (2005)¹⁷ from the mental health field (which is a leading discipline in developing and implementing shared care models^{113, 114}) – shared care is both about how systems agree to work together and about different groups of clinicians work together.

Shared care record

A shared care record appears in between an official medical record and a personal health record (PHR) due to its purpose to support shared care by sourcing data from multiple systems and providing access to multiple users. An electronic shared care record may facilitate effective transfer of care as it assists effective handover.¹¹⁵ A shared EHR could be “a patient-centric longitudinal (womb to tomb) electronic record of an individual” that contains data from multiple electronic medical records and is shared across organisations.¹¹⁶ Grain (2004) cited the International Standards Organisation (ISO) definition of EHR for integrated care (ICSHR)¹¹⁷ and pointed out its primary purpose being the “support of continuing, efficient and quality integrated health care.”¹¹⁸

New Zealand National Health IT Plan has targeted shared care in Phase 2 (over the next 5 to 10 years) of its “integrated healthcare model;” the Plan stated that in this phase the concept of a shared care record will start to develop.¹¹⁹

Appendix B: Schedule of interview questions

The programme stakeholders identified the four main domains – outcome, social, technology and economic – as the core areas with which an understanding of shared care needed to be obtained. Within these domains, the stakeholders identified some key questions that were important to answer.

The evaluation methodology, by design has and will continue to identify a large number of areas of investigation; however, the evaluation is designed to prioritise the following key questions.

- Outcome
 - Were links and decision making across the care provider continuum strengthened
 - In what way(s)?
 - Did shared care plans support/encourage closer collaboration and communication between health care providers and across sectors?
 - In what way?
 - How did this apply to direct care plan activity and beyond direct care planning
 - Were working relationships within, across and between providers and with their patients improved and to what extent can they be viewed as sustainable
 - Did shared care planning enable the integration of complex multi-disciplinary health services?
 - How?
 - Have issues arisen with health delivery such as workforce, roles and responsibilities, legal and clinical accountabilities, workflow, patient safety, privacy and confidentiality
 - Did shared care plans (and associated workflows) change patterns of healthcare utilisation by patients?
 - How is this demonstrated?
- Social
 - Did the shared care plans contribute to the quality of health professional – patient interaction?
 - How did this occur (communication, continuity of care, knowledge of health by patient and knowledge of patient by the care team)

- Did satisfaction with care interaction change
 - among patients and carers
 - among primary and secondary care clinicians
- Did shared care simplify complex tasks?
 - How?
- What workforce training impacts did shared care planning have?
- Technical
 - Were clinicians and or patients/whanau able to access and use the shared care plans?
 - If yes, what were the patterns of use (frequency, patient/family use of edit/communication functions)
 - If no, what were the issues?
 - Was the information presented in a form that promoted utilisation
 - Did the system workflow encourage and enable uptake by clinicians and patients/whanau/carers
 - Were a core set of elements that describe shared care and the optimal platform(s) for a wider roll out identified
- Economic
 - What are the business models that emerge from the study that will support and enable wider uptake?

Given the programme timeline it is intended that the following objectives will be investigated; however, the information collected may only be sufficient to frame a more comprehensive set of indicators and measures that could be collected from a wider deployment of shared care planning.

- To what degree, if any, does a shared care approach enable a more economical and efficient means for the person, family / whānau, providers and funding agency to manage a person's chronic condition
- Are there clear indicators of impact of health system utilisation, such as unplanned admission rates, presentations to ED, outpatient clinic attendances, involvement of other allied providers, increased primary care utilisation

- What was the impact on resources and resource utilisation of the introduction of shared care planning and was this acceptable and realistic
- Is it possible to related benefits to scale of implementation and hence consider a greater level of investment

Appendix C: Patient Questionnaire Instruments – PACIC, PIH and Morisky

Patient Name: _____	NHI _____
Assessment Date: :...../...../	Review Date:...../...../
(Use assessment date for first completion).	(Use Review date for the completion at end).

Please circle the number that most closely fits for you

A1. Overall, what I know about my health condition(s) is:																		
<table style="margin: auto;"> <tr> <td style="border: none;">0</td> <td style="border: none;">1</td> <td style="border: none;">2</td> <td style="border: none;">3</td> <td style="border: none;">4</td> <td style="border: none;">5</td> <td style="border: none;">6</td> <td style="border: none;">7</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;">Very little</td> <td colspan="6" style="border: none;">Something</td> <td colspan="2" style="border: none;">A lot</td> </tr> </table>	0	1	2	3	4	5	6	7	8	Very little	Something						A lot	
0	1	2	3	4	5	6	7	8										
Very little	Something						A lot											
A2. Overall, what I know about my medication/s & treatment/s for my health condition(s) is:																		
<table style="margin: auto;"> <tr> <td style="border: none;">0</td> <td style="border: none;">1</td> <td style="border: none;">2</td> <td style="border: none;">3</td> <td style="border: none;">4</td> <td style="border: none;">5</td> <td style="border: none;">6</td> <td style="border: none;">7</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;">Very little</td> <td colspan="6" style="border: none;">Something</td> <td colspan="2" style="border: none;">A lot</td> </tr> </table>	0	1	2	3	4	5	6	7	8	Very little	Something						A lot	
0	1	2	3	4	5	6	7	8										
Very little	Something						A lot											
A3. I take medications or carry out the treatments asked by my healthcare team:																		
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0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always											
A4. I share in decisions made about my health condition(s) with my healthcare team:																		
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0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always											
A5. I am able to deal with health professionals to get the services I need that fit with my culture, values and beliefs:																		
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0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always											
A6. I attend appointments as asked by my healthcare team:																		
<table style="margin: auto;"> <tr> <td style="border: none;">0</td> <td style="border: none;">1</td> <td style="border: none;">2</td> <td style="border: none;">3</td> <td style="border: none;">4</td> <td style="border: none;">5</td> <td style="border: none;">6</td> <td style="border: none;">7</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;">Never</td> <td colspan="6" style="border: none;">Sometimes</td> <td colspan="2" style="border: none;">Always</td> </tr> </table>	0	1	2	3	4	5	6	7	8	Never	Sometimes						Always	
0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always											
A7. I keep track of my symptoms and early warning signs (e.g. blood sugar levels, peak flow, weight, shortness of breath, swelling, pain, sleep problems, mood):																		
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0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always or Not needed											
A8. I take action when my early warning signs or symptoms get worse:																		
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0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always											
A9. I manage the effect of my health condition(s) on <i>my daily physical activities</i> (e.g. walking, hobbies & household tasks):																		
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0	1	2	3	4	5	6	7	8										
Not very well	Fairly well						Very well											
A10. I manage the effect of my health condition(s) on <i>how I feel</i> (i.e. my emotions and spiritual wellbeing):																		
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0	1	2	3	4	5	6	7	8										
Not very well	Fairly well						Very well											
A11a. I manage the effect of my health condition(s) on <i>my social life</i> (i.e. how I mix and connect with others and in my personal relationships):																		
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0	1	2	3	4	5	6	7	8										
Not very well	Fairly well						Very well											
A11b. I have enough support from my family/whānau or carers to manage my health:																		
<table style="margin: auto;"> <tr> <td style="border: none;">0</td> <td style="border: none;">1</td> <td style="border: none;">2</td> <td style="border: none;">3</td> <td style="border: none;">4</td> <td style="border: none;">5</td> <td style="border: none;">6</td> <td style="border: none;">7</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;">Never</td> <td colspan="6" style="border: none;">Sometimes</td> <td colspan="2" style="border: none;">Always</td> </tr> </table>	0	1	2	3	4	5	6	7	8	Never	Sometimes						Always	
0	1	2	3	4	5	6	7	8										
Never	Sometimes						Always											
A12. Overall, I manage to live a healthy lifestyle (e.g. I don't smoke and I am not a heavy drinker, I eat healthy food, do regular physical activity, manage my stress and sleep well):																		
<table style="margin: auto;"> <tr> <td style="border: none;">0</td> <td style="border: none;">1</td> <td style="border: none;">2</td> <td style="border: none;">3</td> <td style="border: none;">4</td> <td style="border: none;">5</td> <td style="border: none;">6</td> <td style="border: none;">7</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;">Not very well</td> <td colspan="6" style="border: none;">Fairly well</td> <td colspan="2" style="border: none;">Very well</td> </tr> </table>	0	1	2	3	4	5	6	7	8	Not very well	Fairly well						Very well	
0	1	2	3	4	5	6	7	8										
Not very well	Fairly well						Very well											

Over the past 6 months, when I received care for my ongoing health condition, I was:

Please circle the response that most closely fits your answer	None of the time	A Little of the Time	Some of the Time	Most of the Time	Always	Not applicable
B1. Asked for my ideas when we talk about and create my care plan.	1	2	3	4	5	NA
B2. Given choices about care/ treatment to think about.	1	2	3	4	5	NA
B3. Asked to talk about any problems with my medicines or their effects on me.	1	2	3	4	5	NA
B4. Given a written list of things I should do to improve my health.	1	2	3	4	5	NA
B5. Satisfied that my care was well organized.	1	2	3	4	5	NA
B6. Shown how my actions did to take care of myself influenced my condition.	1	2	3	4	5	NA
B7. Asked to talk about my goals in caring for my condition.	1	2	3	4	5	NA
B8. Helped to set specific goals to improve my eating or exercise.	1	2	3	4	5	NA
B9. Given a copy of my care plan to take away.	1	2	3	4	5	NA
B10. Encouraged to go to a specific group or class to help me cope with my chronic condition.	1	2	3	4	5	NA
B11. Asked questions, either directly or on a survey, about my health habits.	1	2	3	4	5	NA

Over the past 6 months, when I received care for my ongoing health condition, I was:						
Please circle the answer that most closely fits your answer	None of the time	A Little of the Time	Some of the Time	Most of the Time	Always	Not applicable
B12. Sure that my doctor or nurse thought about my values, beliefs, and traditions when they recommended treatments to me.	1	2	3	4	5	NA
B13. Helped to make a care plan that I could carry out in my daily life.	1	2	3	4	5	NA
B14. Helped to plan ahead so I could take care of my condition even in hard times.	1	2	3	4	5	NA
B15. Asked how my long term condition affects my life.	1	2	3	4	5	NA
B16. Contacted after a visit to see how things were going.	1	2	3	4	5	NA
B17. Encouraged to attend programs in the community that could help me.	1	2	3	4	5	NA
B18. Referred to a dietician, health educator, or counsellor when needed.	1	2	3	4	5	NA
B19. Told how my visits with other types of health professionals, helped my treatment.	1	2	3	4	5	NA
B20. Asked how my visits with other health professionals were going.	1	2	3	4	5	NA
B21. Confident that my doctors and nurses are well informed of my care plan.	1	2	3	4	5	NA

Please circle the number that best reflects your response

Question	Never	Rarely	Sometimes	Often	Always
C1. Do you ever forget to take your medicine?	0	1	2	3	4
C2. Are you careless at times about taking your medicine?	0	1	2	3	4
C3. When you feel better do you sometimes stop taking your medicine?	0	1	2	3	4
C4. Do you know the long term benefit of taking your medicine as discussed with you by your health care team	0	1	2	3	4
C5. Sometimes do you forget to refill your prescription on time	0	1	2	3	4

Appendix D: Provider Questionnaire Instrument - ACIC

Assessment of Chronic Illness Care Version 3.5	
<p>The Assessment of Chronic Illness Care (ACIC) is an evidence-based tool that is widely used across the world to help guide quality improvement work. It can be used by large and small health organisations so in NZ this could be DHBs, PHOs, through to general practice teams.</p> <p>Please complete the following information about your practice, organisation or service. This information will help you identify areas you are doing well and areas you may wish to focus on during this quality improvement programme.</p> <p>The collated results will also be useful to help you assess how you are doing compared to similar groups, practices or organisations if you so wish.</p> <p>We would like to get your phone number and e-mail address in the event that we need to contact you/your team in the future. Please also indicate the names of persons (e.g., team members) who complete the survey with you.</p>	
Your name:	Date:
Role:	Names of other persons completing the survey with you:
Contact Details:	1.
	2.
	3.
	4.
Your phone number:	Your e-mail address:
Directions for Completing the Survey	
<p>This survey is designed to help practices move toward the “state-of-the-art” in managing long term conditions. The questions have been developed based on evidence-based principles and approaches for improving health outcomes in populations with long-term conditions. You can focus on one particular area, such as diabetes or heart disease, or take a generic approach focusing on long-term conditions in general which is recommended for general practice teams. The results can be used to help your team identify areas for improvement.</p> <p>Instructions are as follows:</p> <ol style="list-style-type: none"> 1. Answer each question regarding how your practice/service is doing with respect to long-term conditions in general or if you are a specific service (eg renal or diabetes), then with regard to your patient population. 2. For each row, circle the point value that best describes the level of care that currently exists at your practice/service for the area you have chosen. The rows in this form present key aspects of chronic illness care. Each aspect is divided into levels showing various stages in improving chronic illness care. The stages are represented by points that range from 0 to 11. The higher point values indicate that the actions described in that box are more fully implemented. 3. Add up the points in each section (e.g., total part 1 score), calculate the average score (e.g., total part 1 score / # of questions), and enter these scores in the space provided at the end of each section. Then sum all of the section scores and complete the average score for the program as a whole by dividing this by 6 (or 7 if the integration questions are included). 	

Assessment of Chronic Illness Care, Version 3.5 modified for NZ

Part 1: Organisation of the Healthcare Delivery System. Chronic illness management programs can be more effective if the overall system (organisation) in which care is provided is oriented and led in a manner that allows for a focus on chronic illness care.

Components	Level D	Level C	Level B	Level A
1. Overall Organisational Leadership in Chronic Illness Care	...does not exist or there is little interest.	...is reflected in vision statements and business plans, but no resources are specifically earmarked to execute the work.	...is reflected by senior leadership and specific dedicated resources (dollars and personnel).	...is part of the system's long term planning strategy, receive necessary resources, and specific people are held accountable.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Organisational Goals for Chronic Care	...do not exist or are limited to one condition.	...exist but are not actively reviewed.	...are measurable and reviewed.	...are measurable, reviewed routinely, and are incorporated into plans for improvement.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. Improvement Strategy for Chronic Illness Care	...is ad hoc and not organised or supported consistently.	...utilizes ad hoc approaches for targeted problems as they emerge.	...utilizes a proven improvement strategy for targeted problems.	...includes a proven improvement strategy and uses it proactively in meeting organizational goals.
Score	0 1 2	3 4 5	6 7 8	9 10 11
4. Incentives and Regulations for Chronic Illness Care	...are not used to influence clinical performance goals.	...are used to influence utilization and costs of chronic illness care.	...are used to support patient care goals.	...are used to motivate and empower providers to support patient care goals.
Score	0 1 2	3 4 5	6 7 8	9 10 11
5. Senior Leaders	...discourage enrollment of the chronically ill.	...do not make improvements to chronic illness care a priority.	...encourage improvement efforts in chronic care.	...visibly participate in improvement efforts in chronic care.
Score	0 1 2	3 4 5	6 7 8	9 10 11
6. Funding streams	...discourage patient self-management or system changes.	...neither encourage nor discourage patient self-management or system changes.	...encourage patient self-management or system changes.	...are specifically designed to promote better chronic illness care.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Health Care Organisation Score _____ Average Score (Health Care Org. Score / 6) _____

Part 2A: Community Linkages. Linkages between the health delivery system (or provider practice) and community resources play important roles in the management of long term conditions. Please answer these questions from your practice or service perspective:

Components	Level D	Level C	Level B	Level A
1. Linking Patients to Outside Resources	...is not done systematically.	...is limited to a list of identified community resources in an accessible format.	...is accomplished through a designated staff person or resource responsible for ensuring providers and patients make maximum use of community resources.	... is accomplished through active coordination between the health system, community service agencies and patients.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Partnerships with Community Organisations	...do not exist.	...are being considered but have not yet been implemented.	...are formed to develop supportive programs and policies.	...are actively sought to develop formal supportive programs and policies across the entire system.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. PHO and DHB Health Plans	...do not coordinate long term conditions guidelines, measures or care resources at the practice or service level.	...would consider some degree of coordination of guidelines, measures or care resources at the practice/service level but have not yet implemented changes.	...currently coordinate guidelines, measures or care resources in one or two long-term condition areas.	...currently coordinate chronic illness guidelines, measures and resources at the practice/service level for most long-term conditions.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Community Linkages Score _____

Average Score (Community Linkages Score / 3) _____

Part 3: Practice Level. Several components that manifest themselves at the level of the individual practice have been shown to improve long term condition care. These characteristics fall into general areas of self-management support, delivery system design issues that directly affect the practice, decision support, and clinical information systems.

Part 3a: Self-Management Support. Effective self-management support can help patients and families cope with the challenges of living with and treating long-term conditions and reduce complications and symptoms.

Components	Level D	Level C	Level B	Level A
1. Assessment and Documentation of Self-Management Needs and Activities	...are not done.	...are expected.	...are completed in a standardized manner.	...are regularly assessed and recorded in standardized form linked to a treatment plan available to practice and patients
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Self-Management Support	...is limited to the distribution of information (pamphlets, booklets).	...is available by referral to self-management classes or educators.	...is provided by trained clinical educators who are designated to do self-management support, affiliated with each practice, and see patients on referral.	...is provided by clinical educators affiliated with each practice, trained in patient empowerment and problem-solving methodologies, and see most patients with long-term conditions.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. Addressing Concerns of Patients and Families	...is not consistently done.	...is provided for specific patients and families through referral.	...is encouraged, and peer support, groups, and mentoring programs are available.	...is an integral part of care and includes systematic assessment and routine involvement in peer support, groups or mentoring programs.
Score	0 1 2	3 4 5	6 7 8	9 10 11
4. Effective Behavior Change Interventions and Peer Support	...are not available.	...are limited to the distribution of pamphlets, booklets or other written information.	...are available only by referral to specialized centers staffed by trained personnel.	...are readily available and an integral part of routine care.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Self-Management Score _____

Average Score (Self Management Score / 4) _____

Part 3b: Decision Support. Effective long-term condition management programmes assure that providers have access to evidence-based information necessary to care for patients - decision support. This includes evidence-based practice guidelines or protocols, specialty consultation, provider education, and activating patients to make provider teams aware of effective therapies.

Components	Level D	Level C	Level B	Level A
1. Evidence-Based Guidelines	...are not available.	...are available but are not integrated into care delivery.	...are available and supported by provider education.	...are available, supported by provider education and integrated into care through reminders and other proven provider behavior change methods.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Involvement of Specialists in Improving Primary Care	...is primarily through traditional referral.	...is achieved through specialist leadership to enhance the capacity of the overall system to routinely implement guidelines.	...includes specialist leadership and designated specialists who provide primary care team training.	...includes specialist leadership and specialist involvement in improving the care of primary care patients.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. Provider Education for Long Term Condition Care	...is provided sporadically.	...is provided systematically through traditional methods.	...is provided using optimal methods (e.g. academic detailing).	...includes training all practice teams in long term condition care methods such as population-based management, and self-management support.
Score	0 1 2	3 4 5	6 7 8	9 10 11
4. Informing Patients about Guidelines	...is not done.	...happens on request or through system publications.	...is done through specific patient education materials for each guideline.	...includes specific materials developed for patients which describe their role in achieving guideline adherence.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Decision Support Score _____

Average Score (Decision Support Score / 4) _____

Part 3c: Delivery System Design. Evidence suggests that effective long term condition management involves more than simply adding additional interventions to a current system focused on acute care. It may necessitate changes to the organization of practice that impact provision of care.

Components	Level D	Level C	Level B	Level A
1. Practice/Service Team Functioning	...is not addressed.	...is addressed by assuring the availability of individuals with appropriate training in key elements of long term condition care.	...is assured by regular team meetings to address guidelines, roles and accountability, and problems in chronic illness care.	...is assured by teams who meet regularly and have clearly defined roles including patient self-management education, proactive follow-up, and resource coordination and other skills in long term condition care.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Practice/Service Team Leadership	...is not recognized locally or by the system.	...is assumed by the organization to reside in specific organizational roles.	...is assured by the appointment of a team leader but the role in long term conditions is not defined.	...is guaranteed by the appointment of a team leader who assures that roles and responsibilities for long term condition care are clearly defined.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. Appointment System	...can be used to schedule acute care visits, follow-up and preventive visits.	...assures scheduled follow-up with people with long term conditions.	...are flexible and can accommodate innovations such as customized visit length or group visits.	...includes organization of care that facilitates the patient seeing multiple providers in a single visit.
Score	0 1 2	3 4 5	6 7 8	9 10 11
4. Follow-up	...is scheduled by patients or providers in an ad hoc fashion.	...is scheduled by the practice in accordance with guidelines.	...is assured by the practice team by monitoring patient utilization.	...is customized to patient needs, varies in intensity and methodology (phone, in person, email) and assures guideline follow-up.
Score	0 1 2	3 4 5	6 7 8	9 10 11
5. Planned Visits for Chronic Illness Care	...are not used.	...are occasionally used for complicated patients.	...are an option for interested patients.	...are used for all patients and include regular assessment, preventive interventions and attention to self-management support.
Score	0 1 2	3 4 5	6 7 8	9 10 11
6. Continuity of Care	...is not a priority.	...depends on written communication between primary care providers and specialists, case managers	...between primary care providers and specialists and other relevant providers is a priority but not implemented systematically.	...is a high priority and all chronic disease interventions include active coordination between primary care, specialists and other relevant groups.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Delivery System Design Score _____

Average Score (Delivery System Design Score / 6) _____

Part 3d: Clinical Information Systems. Timely, useful information about individual patients and populations of patients with long-term conditions is a critical feature of effective programmes, especially those that employ population-based approaches.^{7,8}

Components	Level D	Level C	Level B	Level A
1. Registry (list of patients with specific conditions)	...is not available.	...includes name, diagnosis, contact information and date of last contact either on paper or in a computer database.	...allows queries to sort sub-populations by clinical priorities.	...is tied to guidelines which provide prompts and reminders about needed services.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Reminders to Providers	...are not available.	... include general notification of the existence of a chronic illness, but does not describe needed services at time of encounter.	...includes indications of needed service for populations of patients through periodic reporting.	...includes specific information for the team about guideline adherence at the time of individual patient encounters.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. Feedback	...is not available or is non-specific to the team.	...is provided at infrequent intervals and is delivered impersonally.	...occurs at frequent enough intervals to monitor performance and is specific to the team's population.	...is timely, specific to the team, routine and personally delivered by a respected opinion leader to improve team performance.
Score	0 1 2	3 4 5	6 7 8	9 10 11
4. Information about Relevant Subgroups of Patients Needing Services	...is not available.	...can only be obtained with special efforts or additional programming.	...can be obtained upon request but is not routinely available.	...is provided routinely to providers to help them deliver planned care.
Score	0 1 2	3 4 5	6 7 8	9 10 11
5. Patient Care Plans	...are not expected.	...are achieved through a standardized approach.	...are established collaboratively and include self management as well as clinical goals.	...are established collaboratively and include self management as well as clinical management. Follow-up occurs and guides care at every point of service.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Clinical Information System Score _____

Average Score (Clinical Information System Score / 5) _____

Part 4: Integration of Chronic Care Model Components. Effective systems of care integrate and combine all elements of the Chronic Care Model; e.g., linking patients’ self-management goals to information systems/registries.

Components	Little support	Basic support	Good support	Full support
1. Informing Patients about Guidelines	...is not done.	...happens on request or through system publications.	...is done through specific patient education materials for each guideline.	...includes specific materials developed for patients which describe their role in achieving guideline adherence.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2. Information Systems/Registries	...do not include patient self-management goals.	...include results of patient assessments (e.g., functional status rating; readiness to engage in self-management activities), but no goals.	...include results of patient assessments, as well as self-management goals that are developed using input from the healthcare team and patient.	...include results of patient assessments, as well as self-management goals that are developed using input from the healthcare team and patient; and prompt reminders to the patient and/or provider about follow-up and periodic re-evaluation of goals.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3. Community Programmes e.g., Green Prescription, Diabetes Self Management Courses, QUIT line	...do not provide feedback to the practice about patients’ progress in their programs.	...provide sporadic feedback at joint meetings between the community and practice about patients’ progress in their programs.	...provide regular feedback to the practice/service using formal mechanisms (e.g., Internet progress report) about patients’ progress.	...provide regular feedback to the practice/service about patients’ progress that requires input from patients that is then used to modify programmes to better meet the needs of patients.
Score	0 1 2	3 4 5	6 7 8	9 10 11
4. Practice Planning for Long Term Condition Care	...does not involve a population-based approach.	...uses data from information systems to plan care.	...uses data from information systems to proactively plan population-based care, including the development of self-management programs and partnerships with community resources.	...uses systematic data and input from practice teams to proactively plan population-based care, including the development of self-management programs and community partnerships, that include a built-in evaluation plan to determine success over time.

Components	Little support			Basic support			Good support			Full support			
	Score	0	1	2	3	4	5	6	7	8	9	10	11
5. Routine follow-up for appointments, patient assessments and goal planning		...is not ensured.			is sporadically done, usually for appointments only.			is ensured by assigning responsibilities to specific staff (e.g., nurse case manager).			is ensured by assigning responsibilities to specific staff (e.g., nurse case manager) who uses the registry and other prompts to coordinate with patients and the entire healthcare team.		
6. Guidelines for long term condition care		...are not shared with patients.			...are given to patients who express a specific interest in self-management of their condition.			...are provided for all patients to help them develop effective self-management or behavior modification programs, and identify when they should see a provider.			...are reviewed by the practice/service team with the patient to devise a self-management or behavior modification program consistent with the guidelines that takes into account patient's goals and readiness to change.		
Score	0	1	2	3	4	5	6	7	8	9	10	11	

Total Integration Score (SUM items): _____

Average Score (Integration Score/6) = _____

ACIC Summary & Scoring Template

Bring forward scoring at end of each section to this page and add to table below.

Also briefly describe the process you used to fill out the form and add to the last column (e.g., reached consensus in a face-to-face meeting; filled out by the team leader in consultation with other team members as needed; or each team member filled out a separate form and the responses were averaged).

Process Used:

Sub-scales	Total Score	Average Score per subscale
Part 1: Organisation		
Part 2: Community Linkages		
Part 3A: Self-Management Support Score		
Part 3B: Decision Support Score		
Part 3C: Delivery System Design Score		
Part 3D: Clinical Information System Score		
Part 4: Integration of CCM Components		
Overall Programme Scores	Total:	Average:

What does it mean?

The ACIC is organised such that the highest "score" (an "11") on any individual item, subscale, or the overall score (an average of the six ACIC subscale scores) indicates optimal support for chronic illness. The lowest possible score on any given item or subscale is a "0", which corresponds to limited support for chronic illness care. The interpretation guidelines are as follows:

Between "0" and "2" = limited support for long term condition care

Between "3" and "5" = basic support for long term condition care

Between "6" and "8" = reasonably good support for long term condition care

Between "9" and "11" = fully developed long term condition care

It is fairly typical for teams to begin a collaborative with average scores below "5" on some (or all) areas the ACIC. It is also common for teams to initially believe they are providing better care for chronic illness than they actually are. As you progress with your quality improvement work you will become more familiar with what an effective system of care involves. You may even notice your ACIC scores "declining" even though you have made improvements; this is most likely the result of your better understanding of what a good system of care looks like. Over time, as your understanding of good care increases and you continue to implement effective practice changes, you should see overall improvement on your ACIC scores.

Appendix E. CCMS NSCP Quick Guide Produced by HSAGlobal



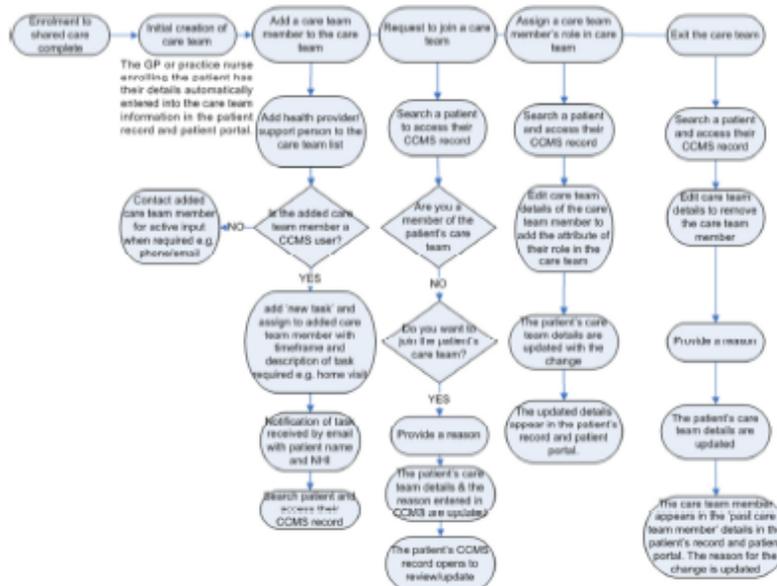
National Shared Care Plan Project Quick Guide

The National Shared Care Plan pilot projects aim to improve coordination of care and communication for the patient with their 'care team', to reduce the number of times they need to give health providers the same details about their condition/treatment and the duplication of investigations carried out on long-term condition patients.

The pilots aim to integrate primary, community and secondary service care planning for long-term condition patients, enabled by the information technology system called the Collaborative Care Management Solution (CCMS); enabling shared access to care plans, patient health information and technology enabled communication on a patient's shared care plan. A care plan with well-defined patient centred goals, actions and time-frames will be developed by health providers with the patient. The most recent version of the care plan will be accessible to the patient and their 'care team' at any time.

Enrolment Process

There will be one programme in the Northern Region instance of CCMS called 'shared care'. Patients will be enrolled in the 'shared care' programme to commence their shared care planning. Health providers/services will be invited to be a member of a patient's 'care team' and to provide input into the patient's shared care plan once the patient is known to their service; or the health providers may nominate themselves to be a member of the patient's care team. For the Northern Region instance of CCMS, referral into service related programmes in CCMS to receive services is not required as existing referral management processes will be used.



Care Team

The care team is a group of people with active responsibility in helping the patient achieve their health goals - e.g. health providers involved in the patient's care, the patient and their support persons (e.g. care giver, Whanau/family member).



Accessing an Enrolled Patient Record in CCMS

<p>Patient Search</p> <ul style="list-style-type: none"> Type in the Patient Name, Patient NHI, or DOB of the patient Select Search <p><i>Note: If searching by patient name, a minimum of 2 letters is required</i></p>	
<ul style="list-style-type: none"> Double Click required patient name to return patient in context <p><i>Note: If you are not a member of the patient's care team a security page will be returned and you will be prompted for a reason to access the patient record</i></p>	
<p>Join Care Team</p> <ul style="list-style-type: none"> Select Join the Care Team Select Role Select Reason for Access Select Access Record <p>One Off record access</p> <ul style="list-style-type: none"> Select Access one off Select Reason for Access Select Access Record 	
<p>Patient Overview page will be displayed with Active Medications, Care Team Members, Current Diagnoses and Tasks</p> <p><i>Note: The user can create new tasks from this page, but the remaining fields are <u>view only</u></i></p>	



Notifications and Communication

CCMS communications will only be used for non-urgent communication using the following CCMS functionality:

- CCMS Tasks –used to request an action within CCMS of a ‘care team’ member (including the patient) or health provider with a timeframe, assignee and assignor. (Notification of new task and overdue task sent to email address)
- Patient Messages – used to communicate within CCMS, on general matters to other ‘care team’ members about a specific patient or to the patient themselves if they have access to the Patient Portal. CCMS patient messages are secure messages that become a part of the patient’s shared care record.
- Notes (note type that forwards to the PMS) – used to provide an update on the patient’s progress to the PMS Inbox, following an encounter with the patient (planned or unplanned).

<p>Create Tasks</p> <p><i>Note: Tasks can be created from the Home page, Patient Medications and Patient Care Plan</i></p> <ul style="list-style-type: none"> • Select Add New 	
<ul style="list-style-type: none"> • Document task Subject • Assign task to CCMS User to • Select Due Date • Document Details • Save <p><i>Note: Once a task is saved an email notification will be sent to the assignee and the assignor</i></p>	
<p>Create Patient Messages</p> <p><i>Note: Patient messages can be accessed from the Home or Patients tab</i></p> <ul style="list-style-type: none"> • Select Messages • Select Compose • Select 1 or more of the Available Recipients for the message • Add selected recipients • Complete message Subject and Details • Save 	



Shared Care Plan Creation and Review

<p>From the Patient Overview page select the 'Plans' tab</p>	
<p>Within the 'Plans' page, select 'add new'</p>	
<p>Give the care plan a 'title' and select a 'template' as a minimum to complete mandatory requirements to create a care plan.</p> <p>Available plans templates to select from include:</p> <ul style="list-style-type: none"> • Generic Shared Care plan with 4 levels including headings labelled on first level, then problem, goal, and action • A plan with 3 levels for problem, goal and action • A plan with 2 levels for goal and action <p>Select 'save' to create the care plan</p>	
<p>The care plan created will open with the template structure selected.</p> <p>In this example the 4 level structure template has been selected has entries in the care plan below the first level</p> <p>Select to populate the next level of the care plan structure with details</p> <p>Select to edit details in that selected level of the plan</p> <p>Select to delete a row in the plan</p> <p>Select to reprioritise items by moving them up or down the plan</p>	



Shared Care Plan Creation and Review (contd)

It is possible to assign an owner and a timeframe for completion for any care plan item by selecting either

In this example, when is selected to populate the next level of the care plan structure with details, it is possible to assign an owner and a timeframe within the same screen

If more than one item at the same level of the plan is required, select 'insert and add another'

To see more detail on the care plan (e.g. owner, scheduled review date), select the down arrow at the far right end of the row titled 'Plan Summary'

To see a list of future/completed care plan reviews, select the down arrow at the far right end of the row titled 'Review List'

Print the care plan for the patient by selecting 'Print'

The screenshot shows the patient profile for NATHAN, Marcus (Mr), born 09 Jan 1932 (79y) Sex Male Primary Identifier. The interface includes tabs for Overview, Recent Activities, This Encounter, Plans, Notes, Measurements, Diagnosis, Medications, and Assessments. The 'Plans' tab is active, showing a table of care plan items:

Name	Notes	Owner	Due Date	Complete
My main priority is				<input type="checkbox"/>
Symptoms I would like help with				<input type="checkbox"/>
monitor my symptoms and respond to warning signs				<input type="checkbox"/>
understand my medications and treatment				<input type="checkbox"/>

Below the table, there are fields for 'Problem', 'Notes', and 'Assign Owner'. At the bottom, there are buttons for 'Insert', 'Insert and Add another', and 'Cancel'. A 'Print' button is also visible in the top right of the plan details area.



Care Delivery and Review

<p>Recent Activities</p> <p>A view of all recent activity for the patient is available from the Recent Activity tab</p> <ul style="list-style-type: none"> • Select Recent Activities tab • A list of all recent activity will be displayed by Date and User • Select expand arrow to view detail of each encounter • Highlight required note to view detail 	
<p>This Encounter</p> <p>The "This Encounter" tab allows the user to document clinical interactions with the patient on a daily basis</p> <ul style="list-style-type: none"> • Select This Encounter tab <p>A blank summary page will be displayed with a menu of tabs for the user to add clinical documentation</p>	
<p>This Encounter – New Note</p> <ul style="list-style-type: none"> • Select New Note • Select Note Type • Complete Details fields and Save <p><i>Note: Note types with this icon  will be sent as a message to PMS systems</i></p>	
<p><i>Note: The Encounter Summary page will display the New note</i></p> <p>This Encounter – New Measurement</p> <ul style="list-style-type: none"> • Select New Measurement • Tick Measurement(s) required • Select Go 	



Care Delivery and Review (contd)

<ul style="list-style-type: none"> • Complete measurement data • Select Save All 	
<p><i>Note: The Encounter Summary page will display the new note and the new measurement</i></p> <p>This Encounter – New Diagnosis</p> <ul style="list-style-type: none"> • Select New Diagnosis • Document diagnosis by typing Diagnosis name in Diagnosis text box or selecting diagnosis from list • Complete required fields and Save 	
<p><i>Note: The Encounter Summary page will display the new note, the new measurement and the new diagnosis</i></p> <p>This Encounter – New Medication</p> <ul style="list-style-type: none"> • Select New Medication • Document drug by typing Drug name in Drug text box or selecting drug from list • Complete required fields and Save 	



End Enrolment

Enrolment into the 'shared care' programme can be stopped. The circumstances when a patient is likely to end enrolment to shared care include:

- The patient no longer consents to being enrolled
- The patient is deceased
- The patient moves location long-term (over 12 months), away from health providers who can access their shared care record.

Only a member of the patient's 'care team' can end enrolment.

End Enrolment

- From **Patients** tab, select **Register**
- From **Available Groups** select **Withdrawn**
- Select **Add**
- **Save**
- If a user attempts to access the patient record the security access page will be returned

Note: If the patient has been withdrawn in error then the user needs to remove the patient from the Withdrawn group.

Appendix F: Evaluation Notes from Participating in Project Meetings

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
2011-03-07	Phase o Weekly Debrief meeting	Neil Hefford (GP) Janet Callendar (general practice nurse) Rob Doughty (secondary specialist) Dipa George, Stuart MacKinnon (project team from healthAlliance) Jim Warren, Helen Gu (NIHI evaluators)	Discussed CCMS Usability: Patient context, message/task visibility
2011-03-14	Phase o Weekly Debrief meeting	Neil Hefford Janet Callendar Rob Doughty Helen McGrinder (secondary nurse) Dipa George, Stuart MacKinnon Andrea Curlew, Jennifer Caldwell, Nara Chilluvuri (technology vendor) Jim Warren, Helen Gu	Agreed - MyPractice interface to remove features for changing patient (always shows the current MyPractice patient) To do - need redesign on summary screen; improve message mechanism
2011-03-18	Specifically on the topic of the evaluation plan	Matt Hector-Taylor (technology vendor) Jim Warren	Discussed the care planning process supported by the software, and the project timeline and objectives. Noted a four-step shared care planning process: enrolment, care planning, care delivery and patient/clinician interaction.
2011-03-21	Phase o Weekly Debrief meeting	Rob Doughty Stuart MacKinnon, Dipa George	Objectives of NSCP: communication, e.g. medications from hospital; virtual input from secondary, e.g. consult specialist. Usability and safety issues and possible solution.

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		Andrea Curlew Jim Warren, Helen Gu	Purpose and responsibility of Phase o.
2011-03-21	Specifically on the topic of the evaluation plan	Stuart Bloomfield (WDHB Information Manager) Stuart MacKinnon, Michael Furlong (project manager, health Alliance) Matt Hector-Taylor, Andrea Curlew Jim Warren, Helen Gu	Discussed evaluation scope, data elements, objectives and methods
2011-03-22	NSCPP Programme Team Meeting	Dipa George, Michael Furlong, Stuart MacKinnon, Sarah Thirlwall (project manager, healthAlliance) Matt Hector-Taylor, Andrea Curlew Gayl Humphrey (NIHI evaluator)	Updates on progress recruiting the various Phase 1 practices and specialist teams. Issues: funding, touch points of other projects with SCP, more secondary services. Phase o issues: messages, Patient in context, integration with PMS Feedback from consumer panel was around consent and who would do the invitation.
2011-03-24	Evaluation/Programme Joint Kick-off Meeting	Sarah Thirlwall, Stuart MacKinnon, Dipa George, Michael Furlong Matt Hector-Taylor, Andrea Curlew Gayl Humphrey, Jim Warren, Helen Gu, Malcolm Pollock (NIHI evaluators)	Discussed how the wider team work together, what meetings are in place (and how these can be used effectively) and how information is to be shared.
2011-03-28	Phase o Weekly Debrief meeting	Rob Doughty Stuart MacKinnon, Dipa George Andrea Curlew, Nara Chilluvuri	Discussed usability issues such as bundling of messages (continue to refine messaging) and summary page design (problem with navigation). Resolved patient context issue. Planned design workshops.

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		Jim Warren, Helen Gu	
2011-04-11	Phase o Weekly Debrief meeting	Rob Doughty Dipa George Andrea Curlew Gayl Humphrey	Discussed usability issues
2011-04-12	1st design workshop with Mt Wellington Family Health Centre	Jim Krietchbaum + four others (GP) Rob Doughty, Jane Hannah (secondary nurse) Janine Bycroft (GP) Akit (Procure representative) Dipa George, Stuart MacKinnon Andrea Curlew, Jennifer Caldwell Gayl Humphrey	Value of secondary interchange is essential There is still a disjoint between the project and the evaluation and hence the consent for the research and an info one for project team. Need to create a health team – however, it is about the key people knowing that a person is enrolled when they need to interact, e.g. ED. Need to improve introduction of shared care and link to the ongoing wider context of integrated care Possible outcome from the other interfaces i.e. PMS and Concerto will do flags with the patient in context
2011-04-12	1st design workshop with Mangere Health Centre	Chris Naughton, Tim Hou + two others (GP) Linda Whickman+ four others (Practice Nurse) Peter Sloggett (Pharmacist) Peter Gow (secondary specialist) Rukmani Shatrohan (secondary nurse) Dipa George, Stuart MacKinnon	Discussed patient eligibility, how to enrol (recruitment processes) and then follow up and develop and change the care plan (data elements). Main concern was time factor and the level of literacy amongst the population. Pharmacy involvement: patients may not go to the local / close ones so who will be invited to participate? There was still confusion re use of system notification. Continuity of utilisation of a tool after the trial: pilots are not well viewed; intent is to keep the solution on going until a decision for wider implementation is made.

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		Andrea Curlew, Jennifer Caldwell Gayl Humphrey	
2011-04-13	1st design workshop with Mangere Family Doctors	Michael Wilson (GP) Donna Snell + two others (Practice Nurse) Zena and Sheray (Pharmacists) Imran (Physiotherapist) Cynthia (Podiatrist) Stephanie McCormack (Optometrist) Sarah Tibby (CMDHB) Dipa George, Stuart MacKinnon Andrea Curlew, Jennifer Caldwell Helen Gu	Discussed CCMS enrolment process Observation: no asking about current workflow Technical glitch / future features: 1). "Note" notification message to MedTech; 2). double entry for non-MedTech users – long-term system integration; 3). Duplicating note writing in CCMS as it can only be populated back to MedTech "Inbox", not "Daily Notes"; 4) ease-of-use.
2011-04-18	Phase o Weekly Debrief meeting	Andrea Curlew Stuart MacKinnon, Dipa George Helen McGrinder Helen Gu	New release to review. 2nd patient consented, but 1st not yet Usability issue: Notes viewing; patient message Tab hidden – difficult to find, besides updating notes; not understanding "generic message"
2011-04-20	1st design workshop with Onewa Road Doctors Surgery	Prakash Appanna (GP), Vangie Durney (Practice Nurse), Lyn Randall (WPHO Long Term Conditions Team Leader),	Discussed the nature of patient (COPD) and benefit of SCP, CCMS enrolment process; how/when to inform the whole care team; who's in charge of shared care; not to duplicate referral process; cost; integration with MedTech, Concerto.

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		<p>Rachel Loyd (WPHO General Manager Primary Care),</p> <p>Shirley Clover, Laura Campbell, Liz Salmon (secondary nurses)</p> <p>Robyn Goonan, (WDHB AIRS Physiotherapist)</p> <p>Stuart MacKinnon, Michael Furlong</p> <p>Andrewa Curlew, Jennifer Caldwell</p> <p>Helen Gu</p>	
2011-04-26	2nd design workshop with Mangere Health centre	<p>Chris Naughton, Tim Hou + two others</p> <p>Practice Nurses – Five attending</p> <p>Peter Gow, Harry Rea (secondary specialist)</p> <p>Sarah Tibby</p> <p>Stuart MacKinnon</p> <p>Andrea Curlew, Jennifer Caldwell</p> <p>Gayl Humphrey</p>	<p>Discussed patient eligibility (current patient for secondary services?); bandwidth capacity; system capacity</p> <p>Issues: Training in the system and shared care will be essential. Currently no definitive plan set for this but noted that Janine and others working to address this.</p>
2011-05-02	Evaluation teleconference	<p>Janine Bycroft</p> <p>Eileen McKinlay (health researcher)</p> <p>Gayl Humphrey, Jim Warren, Helen Gu</p>	<p>Concerns from evaluation activities so far: IT focused while transformation should be key; people's understanding of shared care, care plan, shared care planning theories and the value.</p> <p>Need to communicate concerns to programme team: emphasize risk management.</p>
2011-	Phase o Weekly Debrief	Neil Hefford	Discussed usability issues (visibility of patient enrolled, of message sender/recipient;

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05-02	meeting	Janet Callendar Rob Doughty Helen McGrinder Stuart MacKinnon, Dipa George Andrea Curlew, Jennifer Caldwell, Matt Hector-Taylor Jim Warren, Helen Gu	message editing); Messaging process not working Next release: batch messaging + simplifying some usability. But the release is not fixed a date yet.
2011-05-02	Phone conversation with vendor	Matt Hector-Taylor Jim Warren, Helen Gu	Care plans template: "Staying well plan" based on clinical advisory group suggestion, after the first plan from Heart Failure Guideline proved less relevant to patient's goal.
2011-05-03	Mangere Family Doctors – Design Session 2	Dipa George, Stuart MacKinnon Andrea Curlew, Jennifer Caldwell Michael Wilson Donna Snell, Sue (Practice Nurses) Srey Chhim (Pharmacist) Imran (Physiotherapist) Harry Rea Hazra Sahid, Ruku Shatrohan (secondary nurse). Sarah Tibby Gayl Humphrey	Discussed design document processes, design workshop structure, release timetable, NIHI evaluation team letter. There was discussion around the resistance to the PACIC form – may be some opportunity to reformat the form in recognition it did look busy. Would be very useful to have a member of the evaluation team present to talk about the consent process and ACIC/PACIC forms with the practices There did still need to be a flow diagram to guide clinicians in the process of gaining consent and completing the relevant forms.

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2011-05-03	Programme Team Meeting	Dipa George, Stuart MacKinnon, Sarah Thirlwall Andrea Curlew, Jennifer Caldwell, Matt Hector-Taylor Gayl Humphrey	Discussed design document processes, design workshop structure, release timetable, NIHI evaluation team letter. There was discussion around the resistance to the PACIC form – may be some opportunity to reformat the form in recognition it did look busy. Would be very useful to have a member of the evaluation team present to talk about the consent process and ACIC/PACIC forms with the practices There did still need to be a flow diagram to guide clinicians in the process of gaining consent and completing the relevant forms.
2011-05-04	CMDHB 2nd design workshop (Mangere Family Doctors)	others (?) Gayl Humphrey	Discussed risks related to enrolment and completion of questionnaire. Wide and detailed discussion on time factor and training. The need for practice support was noted, in that it needed to be more than system use but shared care and care planning contextualised. Action: Plan extent of training and practice support required.
2011-05-06	Evaluation feedback to project team	Janine Bycroft Eileen McKinlay Sarah Thirlwall Andrea Curlew Gayl Humphrey, Helen Gu	Discussed risks perceived by evaluation team, e.g. practice understanding. Potential training programs: PDSA; practice coaching based on http://apcc.org.au/ & http://www.health.org.uk/areas-of-work/improvement-programmes/co-creating-health/ NIHI will be helping patients fill PACIC where they find it difficult (e.g. low literacy) Action plan: Find coaches, develop training materials.
2011-05-19	Consumer forum	Martin Orr (WDHB clinical director of information services), Jean McQueen (WDHB care nursing director) Harry Rea	Phase 0: small; test software usability; 4 patients; main issue: communication features of CCMS Phase 1: info access (active care team); enrol process (who gets notified when?); info control by GP; funding (general practice used up CarePlus number already).

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		Janine Bycroft, Karl Cole (GP) Jo Fitzpatrick, Ernie Neuman (Patient rep) Dipa George, Stuart MacKinnon, Michael Furlong, Sarah Tibby Andrea Curlew, Matt Hector-Taylor Helen Gu	CCMS update: Patient portal Patient: who approves my care team? (PHR vs. Official Medical Record) Issues: privacy, security, funding, legal/medical model. Key buy-in factors for clinicians: speed for GP; funding model (who's paying for my time?); ease of use (how many clicks?)
2011-05-31	Programme – Feedback session	Stuart MacKinnon, Sarah Thirlwall, Michael Furlong Andrea Curlew, Jennifer Caldwell, Matt Hector-Taylor Gayl Humphrey	Newsletter structure and content for wider publication. Wide discussion on the involvement of hospital teams: to maximise utilisation Discussed the outcomes from the evaluation team letter (May 2011) with particular effort in discussing the need to activate and support practice team engagement and for the programme members to coalesce as a single team rather than disparate members.
2011-06-14	Programme Team Meeting	Dipa George, Stuart MacKinnon, Sarah Thirlwall, Michael Furlong Andrea Curlew, Jennifer Caldwell, Matt Hector-Taylor Gayl Humphrey	Discussed the evaluation tools and the flow diagram that can be provided to practices on a work flow for recruitment. Reviewed a brief quick recruitment prompt document. Examined and noted the consumer forum feedback regarding user engagement and the information needed to ensure effective informed consent. Training approach discussed extensively and the elements for a training pack refined
2011-06-20	Consumer Input on Privacy and Security Measures	Ernie Neuman, Jo Fitzpatrick Sarah Thirlwall, Michael Furlong Matt Hector-Taylor Helen Gu	Discussed the context of information sharing between primary and secondary and all scenarios of CCMS record access.
2011-	Programme Steering Group	Graeme Osborne (director of national	Discussed the time issues for consenting and effective informed recruitment. Identified

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
06-21	meeting	health IT board) Neil Beney (northland DHB general manager chronic and complex care) Rob Doughty Janine Bycroft, Ken McFarlane (GP) Eileen McKinlay Jo Fitzpatrick, Ernie Newman Sarah Thirlwall, Barry Vryenhoek (CEO of healthAlliance) Matt Hector-Taylor, Malcolm Pollock	strategies for streamlining this effectively Examined current mechanism for reporting issues a) technical and b) user training
2011-07-01	Clinical / Consumer Forum	Harry Rea, Rob Doughty Jean McQueen Janine Bycroft Stuart MacKinnon, Michael Furlong Matt Hector-Taylor Ernie Newman, Jo Fitzpatrick Gayl Humphrey	Most of discussion on the development of the portal and the elements that were perceived as core.
2011-07-12	Programme Team meeting	Janine Bycroft Helen McGrinder Ernie Newman, Jo Fitzpatrick Dipa George, Stuart MacKinnon, Sarah	Reviewed enrolment and issues of utilisation. Aspects of integration raised and will be discussed fully in technical meeting Launching in context still having some issues

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		Thirlwall, Michael Furlong, Deborah Ross (technology trainer at healthAlliance) Matt Hector-Taylor, Andrea Curlew Gayl Humphrey	
2011-08-09	Programme Team meeting	Dipa George, Stuart MacKinnon, Sarah Thirlwall Matt Hector-Taylor, Andrea Curlew, Jennifer Caldwell Gayl Humphrey	Outcomes of increase dialogue with PMS vendor. Reviewed usage reports and improvements for sense. Engagement plan for decision makers
2011-08-12	Evaluation / Programme team meeting	Rob Doughty, Janine Bycroft Ernie Newman, Angela Lim (patient rep) Dipa George, Stuart MacKinnon, Sarah Thirlwall Matt Hector-Taylor, Andrea Curlew, Jennifer Caldwell Malcolm Pollock, Gayl Humphrey, Jim Warren, Helen Gu, Tara Al-naib (NIHI evaluator)	Need to sit with Matt's team for CCMS log data cleaning and analysis; then to sit with stakeholders about what measures they want to see out of log.
2011-08-23	Programme Team meeting	Sarah Thirlwall, Michael Furlong, Stuart MacKinnon Matt Hector-Taylor Gayl Humphrey	Concerto integration discussed. Remind PHOs to inform practices of incentive funding for recruitment. Optimal Usability group engaged to help with patient portal development. How to boost enrolments across all teams

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
2011-08-26	Phase 2 planning	Janine Bycroft Dipa George, Stuart MacKinnon, Sarah Thirlwall, Michael Furlong, Deborah Ross Matt Hector-Taylor, Andrea Curlew Gayl Humphrey, Helen Gu	Goal: 15 practices *100 patients per practice Still CCMS problems: The task notification does not state who initiated or updated/completed a task, and hence it is not possible for the clinician to know what the notification pertains to.
2011-09-06	Program meeting	Dipa George, Sarah Thirlwall, Michael Furlong, Deborah Ross, Christina Smith (tester from healthAlliance) Matt Hector-Taylor, Jennifer Caldwell Gayl Humphrey	There are a few technical issues that are creating some clinical risk: Tasks – people have entered clinical notes in the task and sent, the responding person has written in the task box, overwriting the previous information. Integration issue from CCMS to PMS, e.g. medication. Patient portal: messaging – responsibility, accountability, workload. Also as a message can go to any of the care team but can only be seen in patient context. So if you are not looking or expecting to interact, you will not see it. Systems: lack of wider engagement and lack of support to enable this level of change.
2011-09-07	CCMS log audit meeting	Matt Hector-Taylor, Nara Chilluvuri + 1 (vendor) Jim Warren, Helen Gu	Discussed CCMS query extracts
2011-09-19	Phase 2 strategy	Sarah Thirlwall Jim Warren, Malcolm Pollock	Phase 2 strategy – cautious not viral. Technical issues: usability still. Project managers think the technology is not good enough. Role issues: specialists refusing to receive message from patients.
2011-10-04	Programme Team meeting	Dipa George, Stuart MacKinnon, Sarah Thirlwall, Michael Furlong, Deborah Ross,	Setting planning dates for Phase 2. Discussed evaluation report timing and need to give a brief outline for steering group end October.

Date	Meeting Agenda	Attendees	Summary of Evaluators' Notes
		Christina Smith Matt Hector-Taylor, Jennifer Caldwell Gayl Humphrey	
2011-10-14	Phase 2 planning	Rob Doughty, Janine Bycroft Sarah Tibby, Sarah Thirlwall, Deborah Ross, Dipa George, Stuart MacKinnon, Michael Furlong Matt Hector-Taylor, Brent (vendor) Gayl Humphrey	Fundamental elements that need to be resolved: medications, simplicity of care plan, usability, and consistent terminology and navigation tools etc before going to Phase 2. The confusion of tasks, notes and messages was raised and indicated as needs serious attention. Integration issue with ManTech and apparently they are coming to the party with and creating a test environment. Adding decision support tools and assessment tools? Phase 2: more secondary services? How to engage primary? Incentive? Medico legal? CCMS: a communications tool or a tool for easily creating a care plan that was easily viewable by others? Everyone said the latter, but kept focussing on the former!
2011-10-18	2nd user group meeting	Peter Gow, Robert Doughty Janine Bycroft Donna Snell Laura Campbell, Shirley Clover, Rosemary Unsworth (secondary nurses) Jackie Fleming (Waitemata PHO) Michael Furlong, Dipa George Jennifer Caldwell, Matt Hector-Taylor Gayl Humphrey	Need use cases developed and then business rules. Absence of any whole of system usage. Fundamental architectural issues. Early fixes for medication element: not useful clinically!

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