Evaluation of the Diabetes Nurse Specialist Prescribing project

Report prepared for the New Zealand Society for the Study of Diabetes

Authors: Dr Jill Wilkinson, Professor Jenny Carryer, Dr Jeffery Adams, & Sandy Chaning-Pearce.

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NZSSD project reference group

Dr Paul Drury, NZSSD Medical Director
Professor Tim Cundy, NZSSD President
Mary Meendering, Clinical Nurse Specialist (Immediate past Chair Diabetes Nurse Specialist section NZNO)
Sue Wood, Director of Nursing

Project personnel

Helen Snell, Project Manager
Claire Budge, Specialist data entry

About the evaluators

Jill Wilkinson RN, PhD, MCNA(NZ). Jill is a senior lecturer at Massey University. Her research interests are in primary health care, the development of the nurse practitioner role, and the political context of expanding nursing roles in the community.

Jenny Carryer RN, PhD MNZM FCNA(NZ). Jenny is Professor of Nursing at Massey University and Executive Director of the College of Nurses, Aotearoa (NZ). Her research interests encompass primary health care, long term conditions and nurse practitioner/nursing workforce development.

Jeffery Adams PhD. Jeffery works as an evaluator and qualitative social and health researcher at the SHORE and Whariki Research Centre, Massey University. In addition to undertaking programme evaluation research he teaches evaluation methods and supports the development of evaluation practices in community-based health and social service organisations.

Sandy Chaning-Pearce MA. Sandy has worked in the commercial and public sector designing, analysing and co-ordinating epidemiological surveys and multi-national clinical trials. Before involvement in the present evaluation she was the Primary Health Organization Facilitator for the MidCentral Diabetes Get Checked programme.
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<tr>
<td>ACR</td>
<td>Albumin/creatinine ratio</td>
</tr>
<tr>
<td>BP</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular disease</td>
</tr>
<tr>
<td>DHB</td>
<td>District Health Board</td>
</tr>
<tr>
<td>DNS</td>
<td>Diabetes nurse specialist</td>
</tr>
<tr>
<td>eGFR</td>
<td>Estimated glomerular filtration rate</td>
</tr>
<tr>
<td>EOI</td>
<td>Expression of interest</td>
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<tr>
<td>GDM</td>
<td>Gestational diabetes mellitus</td>
</tr>
<tr>
<td>GP</td>
<td>General practitioner</td>
</tr>
<tr>
<td>HbA1c</td>
<td>Glycated haemoglobin</td>
</tr>
<tr>
<td>HDL</td>
<td>High density lipoprotein</td>
</tr>
<tr>
<td>HIIRC</td>
<td>Health Improvement and Innovation Resource Centre</td>
</tr>
<tr>
<td>HWNZ</td>
<td>Health Workforce New Zealand</td>
</tr>
<tr>
<td>LDL</td>
<td>Low density lipoprotein</td>
</tr>
<tr>
<td>NCNZ</td>
<td>Nursing Council of New Zealand</td>
</tr>
<tr>
<td>NP</td>
<td>Nurse practitioner</td>
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<tr>
<td>NZNO</td>
<td>New Zealand Nurses Organisation</td>
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<tr>
<td>NZSSD</td>
<td>New Zealand Society for the Study of Diabetes</td>
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<tr>
<td>RN</td>
<td>Registered nurse</td>
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1 Executive summary

1.1 Background

The New Zealand Society for the Study of Diabetes Incorporated (NZSSD) was commissioned in October 2010 by Health Workforce New Zealand in partnership with the Nursing Innovations Team of the Ministry of Health to establish four demonstration sites to test the effectiveness and safety of Diabetes Nurse Specialist (DNS) prescribing. New regulations allowed DNS in the project demonstration sites to prescribe a limited number of prescription medicines that are used for health consumers with diabetes under the supervision of an authorised prescriber.

The project took place for a six month period between 11 April and 30 September 2011. Twelve diabetes nurse specialists participated in the project in demonstration sites located in Auckland, Hawkes Bay, Palmerston North and the Hutt Valley. Eleven were authorised by the Nursing Council of New Zealand to prescribe under the new regulations. One nurse was already authorised to prescribe within the nurse practitioner registration.

A team of evaluators from Massey University were commissioned by the NZSSD to independently evaluate the effectiveness of the project.

1.2 Evaluation aim

The aim of the evaluation was to determine whether the project has demonstrated safe, effective, and cost effective prescribing for people with diabetes by diabetes nurse specialists using a ‘designated prescriber’ model, with the objective of informing the implementation and extension of the model elsewhere.

1.3 Evaluation questions

The evaluation addressed the following questions, developed from the objectives established in the tender specification:

- What is the quality of, how safe and how clinically appropriate is DNS prescribing?
- What is the contribution of DNS prescribing to an effective specialist diabetes service?
- Is DNS prescribing acceptable to patients, and what are patients’ experiences of DNS prescribing?
- What are the views of health care professionals?
1.4 Evaluation design

For each of the evaluation questions, criteria and standards of performance were jointly developed by the evaluators and the NZSSD project reference group. These criteria and standards were written as rubrics which were understood as statements of what is ‘valued’ (i.e. what is considered good, valuable, or important) in respect of achieving the project objectives.

The evaluation design had two phases: phase one focussed on how the project was implemented, and phase two on the overall effectiveness of the programme. A range of data sources were used and included a record of patients seen by each DNS (the clinical data record) and prescription decisions (the prescribing log), the number of patients seen by the service, interviews with DNS and diabetes physicians participating in the project, a clinical audit of patient records, surveys of general practitioner, team member and patient views about DNS prescribing, and telephone interviews with patients.

1.5 Main results

1.5.1 What is the quality of, how safe and how clinically appropriate is DNS prescribing?

Overall, the findings show that DNS prescribing is safe, of good quality, and clinically appropriate. Analysis of the data shows there were no adverse events or hospitalisations for patients during the project period that can be attributed to DNS prescribing. Clinical audit findings by the project physicians determined that prescribing decisions were clinically appropriate. In four instances identified in the audit, the information in the notes was insufficient for a determination that the prescribing decision was appropriate, and in one instance an evening insulin dose was questioned. Patient outcomes remained stable throughout and showed an overall improvement in HbA1c. Ninety-six percent of audited prescriptions complied with legal requirements. Planned clinical review took place weekly initially and reduced to monthly as DNS confidence grew.

1.5.2 What is the contribution of DNS prescribing to an effective specialist diabetes service?

Overall, the evaluation findings suggest that DNS prescribing does contribute to an effective specialist diabetes service, but short time frames did not enable productivity gains to be measured. Analysis of the data shows that service usage patterns and feedback from clinicians indicate the available workforce is well utilised, with fewer referrals to diabetes physicians from DNS who are now able to deal with more complex patients themselves. Diabetes physicians have fewer interruptions to their work for requests for prescriptions, there is prompt initiation of treatment for
the co-morbidities associated with diabetes, and DNS consultations are reported by patients, project participants and team members to be more in-depth.

1.5.3 Is DNS prescribing acceptable to patients, and what are patients’ experiences of DNS prescribing?
Overall, the evaluation findings are that DNS prescribing is acceptable to patients who indicate they are highly satisfied with the change. The patient experience of DNS is that they are extremely knowledgeable, and they have high levels of confidence in DNS prescribing decisions and the quality of the consultations DNS provide. They are happy for DNS to prescribe their diabetes-related medicines, report no concerns and they would return to a DNS for a prescription.

Satisfaction is especially related to the convenience of DNS prescribing, it saves patient’s time and they experience fewer delays waiting for a prescription. These factors contribute to a cost effective service for patients. Most patients prefer to seek diabetes-related prescriptions from DNS during the episode of care with the diabetes centre because there are usually fewer costs associated with receiving a prescription.

1.5.4 What are the views of health care professionals?
Overall, the evaluation findings are that the wider diabetes team members are supportive of DNS prescribing and team relationships in the diabetes centres have grown in collegiality. DNS are very satisfied with their extended role and responsibility and a positive impact on workload is anticipated because the prescription process is clearly more efficient. There were some reservations about the workload implications related to providing supervision and about how well prepared some of the nurses were to begin prescribing.

1.6 Conclusions
The findings from this evaluation are that DNS prescribing is safe, of high quality and appropriate. DNS prescribing brings important benefits to the effectiveness of specialist diabetes services, is acceptable to patients, and is supported by the wider health care team. These findings are generally consistent with the findings reported in the international literature about non-medical prescribing in a range of different practice areas.
2 Introduction

The New Zealand Society for the Study of Diabetes Incorporated (NZSSD) was commissioned in October 2010 by Health Workforce New Zealand (HWNZ) in partnership with the Nursing Innovations Team of the Ministry of Health to establish four demonstration sites to test the effectiveness and safety of Diabetes Nurse Specialist (DNS) prescribing. The project was also supported by input from the CVD Diabetes Team in the Sector Capability & Implementation Directorate of the Ministry of Health and the Health Quality & Safety Commission. New regulations allowed DNS in the project demonstration sites to prescribe a limited number of prescription medicines that are used for health consumers with diabetes under the supervision of an authorised prescriber.

The project took place for a six month period between 11 April and 30 September 2011. Twelve diabetes nurse specialists participated in the project in demonstration sites located in Auckland, Hawkes Bay, Palmerston North and the Hutt Valley. Eleven were authorised by the Nursing Council of New Zealand to prescribe under the new regulations. One nurse was already authorised to prescribe within the nurse practitioner registration.

A team of evaluators from Massey University were commissioned by the NZSSD to independently evaluate the effectiveness of the project. The aim of the evaluation has been to determine whether the project has demonstrated safe, effective, and cost effective prescribing for people with diabetes by diabetes nurse specialists using a ‘designated prescriber’ model, with the objective of informing the implementation and extension of the model elsewhere.

There have been discussions for some years between the Ministry of Health, the Nursing Council of New Zealand and nursing’s professional organisations about the need to develop a framework for registered nurse prescribing. The prescribing of medicines is regulated under the Medicines Act 1981 and its associated regulations which provide for two classes of prescribers: authorised and designated prescribers. Authorised prescribers are medical practitioners, dentists and registered midwives and have full prescribing rights and access to all medicines in the Medicines Regulations based on their scope of practice. Nurse practitioners and optometrists are able to prescribe independently as designated prescribers and access a limited range of medicines determined by their area of practice.
Prior to the DNS prescribing project there were no regulations allowing prescribing by registered nurses. The Medicines (Designated Prescriber—Registered Nurses Practising in Diabetes Health) Regulations 2011 made provision for the Nursing Council of New Zealand to authorise changes to scopes of practice for individual practitioners where it was satisfied that the registered nurse has the appropriate qualifications to prescribe.

The nurses who participated in this project work in specialist diabetes services. DNS already operate with a high degree of autonomy, and are largely responsible for the delivery of diabetes services, but their practice has been limited by an inability to prescribe commonly used medicines for diabetes. This results in delays for patients and interruptions to practitioners while a prescription is sought from an authorised prescriber. In many other countries, suitably qualified diabetes nurse specialists are able to prescribe medicines for diabetes.

2.1 Report overview

This report identifies the evaluation aims, and objectives and evaluation questions in section 3. The evaluation design, data sources, collection procedures and analysis are explained in section 4. Section 5 describes how the prescribing project was implemented. Section 6 describes the population of people with diabetes who accessed the diabetes centres during the project. Section 7 presents the findings and conclusions arranged in response to the evaluation questions. Section 8 discusses the evaluation findings and the implications for extending the model elsewhere. Section 9 contains the report appendices in two sections: the first contains a number of documents used for the project; the second contains documents used for the evaluation such as the surveys, including summaries of the collected data. Ethics committee approval and the associated public documents are also included.
3 Evaluation aims and objectives

3.1 Evaluation aim
The aim of the evaluation was to determine whether the project has demonstrated safe, effective, and cost effective prescribing for people with diabetes by diabetes nurse specialists using a ‘designated prescriber’ model, with the objective of informing the implementation and extension of the model elsewhere.

3.2 Evaluation objectives
The objectives of the evaluation set out in the tender specification were as follows:

- How was the innovation project implemented? (description of the process)
- Did the innovation project achieve the desired outcomes? (against project outcomes as outlined in the project plan and to include a clinical audit, quantitative and qualitative data)
- Did the project team learn from the innovation project and make improvements? (description of changes and enhancements made throughout the project in response to progress monitoring)
- Did the whole innovation project represent value for money through positive impacts on the workload of the diabetes medical and nursing team and cost efficiencies for patients?
- Did the innovation project result in any unintended outcomes? (analysis of incidents, other outcomes identified)
- Should the innovation project be generalised and spread? (recommendation including suggested approach).

3.3 Evaluation questions
The evaluation addressed the following questions, developed from the objectives listed in 3.2:

- What is the quality of, how safe and how clinically appropriate is DNS prescribing?
- What is the contribution of DNS prescribing to an effective specialist diabetes service?
- Is DNS prescribing acceptable to patients, and what are patients’ experiences of DNS prescribing?
- What are the views of health care professionals?
3.4 Evaluation approach

For each of the evaluation questions, criteria (dimensions of interest) and standards of performance for each criterion were jointly developed by the evaluators and the NZSSD project reference group. These criteria and standards were written as rubrics which were understood as statements of what is ‘valued’ (i.e. what is considered good, valuable, or important) in respect of achieving the project objectives. Relevant data were then collected, and these descriptive facts compared with the standards established. These were interpreted and woven together which enabled evaluative conclusions to be drawn about the project performance which in turn provided direct answers to the evaluation questions. This approach ensured the evaluation moved beyond simply providing descriptive facts about the project’s implementation results.

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4 Evaluation design

4.1 Overview

The evaluation design had two phases:

**Phase 1:** Focussed on how the project was implemented, staff expectations, and how it actually functioned in each of the demonstration sites with regard to context, delivery and access to the programme. The phase one data collection period ended on 13 June 2011 and an interim analysis was provided to NZSSD on 30 June 2011.

**Phase 2:** Focussed on the overall effectiveness of the programme, impact on patients, multidisciplinary team satisfaction, and safety. Implications of roll-out to other sites were identified. The phase two data collection period ended on 30 September 2011, along with the demonstration project.

4.2 Data sources

The data sources were chosen to reflect the project aims and objectives. Clinical record and prescribing log data from each demonstration site were required by HWNZ as part of the project monitoring requirements. These data were used as evidence to support the evaluation claims.

4.2.1 Phase one data

- A record of patients seen by each DNS (the clinical data record) and prescription decisions (the prescribing log)
- Type of contact, time with each patient and time on administration
- Number of patients seen by the service
- Basic staff demographics
- Face to face interviews with DNS and diabetes physicians participating in the project

4.2.2 Phase two data

- The clinical data record and prescribing logs continued
- Clinical audit of patient records
- Survey of GPs identified in the clinical audit as having patients for whom DNS made prescribing decisions
- Patient satisfaction survey
- Survey of other staff in each team (nurse leaders/managers, non-prescribing nurses)
- Record of adverse events
- Second interview (by telephone or face to face) with DNS and diabetes physicians participating in the project
- Telephone interviews with patients who agreed to participate.

4.3 Data collection procedures

4.3.1 Clinical data record

Two record sheets were developed by the NZSSD Project Manager and project reference group, and checked with the evaluation team; the clinical data record (appendix 9.1.6) and the nurse prescribing log (appendix 9.1.7). Each DNS participating in the project began data collection two weeks prior to the project start and throughout the project, using these two record sheets. The purpose of the clinical data record was for information about the characteristics of the patient population and included information on every patient seen by the prescribing nurses: Age, sex, ethnicity, type of diabetes, duration of diabetes, smoking status, co-morbidity categories and medications were recorded, as well as most recent blood chemistry (HbA1c, ACR, creatinine, eGFR, lipids), weight and blood pressure within the previous three months. For subsequent contact, any blood test results and measurements were entered against a new date for the patient. There were 1274 clinical data record entries in the final dataset.

4.3.2 Prescribing log

Every patient contact was manually recorded by each DNS in the prescribing log. Data collected included date of referral, date of visit, new or repeat patient, type of contact (telephone, email, home visit, or clinic visit), time spent with client, discussion with doctor or dual consultation, referrals made, an estimate of lifestyle factor ‘adherence’, prescriptions written or adjusted, type of drug prescribed, diagnostic tests ordered, and interim GP visits and reason. There were 3,685 entries in the prescribing log during the project period. Of these consultations, 8 percent (n = 283) occurred in the weeks prior to the project start and 92 percent (n = 3402) during the project (11 April – 30 September 2011).

4.3.3 Service usage data

Service usage data counting the total number of patients seen by doctors, DNS, non-prescribing nurses, dietitians, podiatrists and other allied health professionals was requested from each of the demonstration sites for the month prior to the project start and for each month during the project.
4.3.4 Interviews with project staff

Phase one interviews with diabetes nurse specialists and diabetes physicians were completed by 13 June 2011. Semi-structured interviews lasting 30 to 50 minutes were conducted in person by a member of the evaluation team with all available participants (one DNS was not available due to long leave). Participants were provided with information regarding both the evaluation and the interview beforehand. Consent and demographic information were obtained prior to each interview. The interview schedules for all the interviews are at appendix 9.2.4.

Phase two interviews with all participating diabetes nurse specialists and diabetes physicians took place during early September either in person or by telephone. Participants were provided with the planned interview questions ahead of time, and each interview lasted between 15 and 30 minutes.

The NZSSD Project Manager was also interviewed regarding the necessary stakeholder collaboration, process development and tasks that were required for project implementation. The interview with the Project Manager elaborated on the project plan, an excerpt of which is at appendix 9.1.1

4.3.5 Clinical audit

Clinical auditing of the medical record of patients who had received a prescription from a DNS during the month of August was completed by the diabetes physicians at each site. Ten sets of records to be audited for each nurse were identified from the prescribing log data. The audit criteria were developed by the Project Manager and the NZSSD project reference group in conjunction with the evaluation team using a modification of the Medication Appropriateness Index (MAI). The purpose of the audits was to ascertain if prescribing decisions were appropriate and whether or not untoward or adverse events for patients occurred as a result of DNS prescribing decisions. There were 117 clinical audits completed for the evaluation. The audit tool and results are at appendix 9.1.9.

4.3.6 Adverse event documentation

It is usual practice in DHBs to document adverse events concerning patients, staff or property on an incident form. Copies of all incident forms relating to DNS prescribing were to be forwarded to the Project Manager and then the evaluators for analysis and reporting. There were no adverse events during the project that were documented in this way.

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4.3.7 Quality audit of prescriptions

A ‘quality of prescriptions’ audit was also completed by the diabetes physicians at each site. Up to twenty prescriptions written by each DNS during August were assessed against the ‘Form of prescription’ instructions for prescriptions listed in the Medicines Regulations 1984 (Part 7 s41). There were 229 prescriptions audited. The audit tool and results are at appendix 9.1.10.

4.3.8 Surveys

Satisfaction surveys for patients, relevant GPs and team members of the prescribing DNS were developed specifically for the project by the evaluation team in conjunction with the Project Manager and the NZSSD project reference group. Where possible, the survey questions were informed by other UK studies that have evaluated nurse prescribing. ⁴

4.3.8.1 General practitioner survey

General practitioners were identified in the clinical audit process as having patients in the study who attended their practice. During September each demonstration site faxed, emailed or posted these GPs a copy of the survey to complete and return by post to the evaluators. A link was also provided to enable them to complete the survey using the web-survey site, Survey Monkey. It is not known how many GPs received the invitation, but 30 responded, mostly using a paper version. The response rate from the demonstration site areas was as follows: 9 from Auckland, 8 from Hutt Valley, 7 from Palmerston North and 6 from Hawkes Bay. The GP survey and responses are at appendix 9.2.1.

4.3.8.2 Team member survey

Team members of prescribing DNS were invited to complete a survey. An email invitation in September that included a link to the online web-survey site, Survey Monkey was circulated by the lead nurse to non-prescribing DNS, diabetes physicians, resident medical officers, managers, team leaders and others. It is not known how many team members received the email, but 19 completed the survey. The numbers were expected to be small so team members were not asked to identify their demonstration site. The team survey and responses are at appendix 9.2.2.

4.3.8.3 Patient survey

Patients who attended the diabetes centres during August or September and had at some time during the project received a prescription from a DNS were provided with an invitation to complete the online survey on Survey Monkey or a paper copy of the survey. A freepost envelope was included for direct return of the completed survey to the evaluation team. Only a few patients responded via Survey Monkey and most replied using the paper copy. Five hundred reply paid

envelopes were supplied to the demonstration sites (125 to each site) and DNS distributed the survey to patients. In total, 89 patients responded. The response rate from each site varied: there were 49 from Auckland, 18 from Hutt Valley, 13 from Palmerston North and 9 from Hawkes Bay. The patient survey and responses are at appendix 9.2.3.

4.3.8.4 Patient interviews

An invitation to talk to a researcher about DNS prescribing was made on the last page of the patient survey (appendix 9.2.5). Nineteen telephone interviews were subsequently conducted with patients who provided their name and a telephone number to call. An interview schedule was followed and the calls lasted between five and 10 minutes. There were four or five respondents interviewed who lived in each of the demonstration site regions.

4.4 Data entry and analysis

Clinical and prescribing log data were recorded on paper by each DNS, photocopied (for clinical review purposes) and posted to the NZSSD for manual entry into a Microsoft Excel spreadsheet. The spreadsheets were then provided to the evaluation team and coded for import into SPSS Version 19. Data were analysed using descriptive statistics.

The three surveys and the clinical audit data were mostly all provided to the evaluators as paper copy and manually entered into Survey Monkey. The data were then accessed directly for analysis from the Survey Monkey website which provides basic descriptive analysis and crosstab functions, as well as charts, or can be exported as Microsoft Excel files. The quality of prescriptions data were also provided as paper copy and were manually entered into an Excel spreadsheet. The service usage data were provided periodically in Excel spreadsheets by each of the DHBs. Analysis of the service usage data is presented using the daily mean score across all sites.

All interviews were audio-recorded and transcribed using a transcription service, then analysed for common themes with the aid of the qualitative data analysis software package NVivo, version 9. Excerpts from the interviews are presented in this report in italics and referenced with a title and code number to protect the identity of the speaker.

4.4.1 Availability and validity of the monitoring data

The large amount of clinical data required for the evaluation (more than 40 variables per person) was collected in hard copy by busy clinicians, and later forwarded for manual entry into Excel. Where clinical detail was missing, ambiguous or obviously incorrect, clarification was sought from the DNS concerned. However, data missing from the final dataset includes 18 patients with clinical data
recorded, but no prescribing log entries; and 85 patients with prescribing log entries, but no clinical data. It was not possible to check all questionable or missing data given the time available, the busy nature of the clinicians and the size of the database. It is thought that relative to the large amount of data available, the amount of missing or incorrect data is small and will not unduly affect results.

Cross-checking of some of the clinical data was not always possible or feasible. For example, it was beyond the scope of the evaluation to verify with primary care whether a patient had sought another diabetes-related prescription from them during their episode of care with the diabetes centre. Instead information was obtained from the patient reporting to the DNS.

Due to the nature of the study, baseline and end of project patient outcome data was not always available for all patients due to the timing of patients entering and exiting the service. For example some HbA1c results were entered by DNS as baseline data but had been measured many months or even years before the project started. Consequently, blood chemistry results were discarded if they predated 1 January 2011. Additionally, patients may have been seen only once or twice during the project and failed to return for follow up or titration of new medications, and/or a second blood test was not clinically indicated. Cases were selected for comparison of baseline and end of project outcomes if two or more sets of blood test data were available. The same criteria were applied to weight and blood pressure measurements. Women with gestational diabetes were excluded from this analysis.

Likely scenarios for ‘poor’ overall HbA1c outcome data could include: the clinical need to avoid hypoglycaemia especially in the elderly or ‘at risk patients’; some young adults who were referred to the diabetes centre following an admission for diabetic ketoacidosis and consequently have very high HbA1c measurements; referral following an acute inpatient episode of care, for example, a coronary event, a steroid requiring event, a period of time without medications. Subsequent HbA1C would therefore reflect the period of inter-current illness. Despite these reservations, comparison of baseline to end of project data showed an improvement in HbA1c of 0.6 percent or 7mmol/mol.

Analysis of the timeframes between receipt of referral and commencement of care was not feasible due to the fact that many patients had been referred to the service several years previously and continue to be seen periodically. Additionally, at the start of the project new or repeat patients were recorded variously as either new to the service or new to the nurse. Due to the unreliability of these data, analysis has proved unfruitful.
Service usage data proved more difficult to collect and analyse than was originally anticipated. Study cut-off dates did not accord with the monthly dates routinely reported by DHBs making the reporting of the usage data onerous for busy DHB analysts. In addition, clinician fluctuations (leave, staff cuts/resignations, variable hours of employment, the different structure of centres) and changes made during the project to the way data were coded have posed problems. These difficulties have meant abandoning the allied health related data and rendered the presented data less definitive than might have been.

4.5 Ethical considerations

An application for ethical approval was made to the Multi-region Health and Disability Ethics Committee using the expedited review process. Much of the study falls under the definition of a quality assurance activity as defined in the Ethical Guidelines for Observational Studies. However, in the interests of ensuring staff and patient participants who were interviewed provided informed and voluntary consent, and that their rights to privacy and confidentiality would be respected, external review of the evaluation process was sought.

Ethics approval for the evaluation was received on 27 April 2011 (appendix 9.2.5). The numbers of staff participants in the project are small and there had been significant publicity announcing the location of each of the demonstration sites. During the project the following measures were taken to protect the identity of the participants:

- Data are presented in aggregate form
- Identifying information has not been reported.

The public documentation informing project participants and patients about the evaluation and inviting consent to participate in the evaluation are at appendix 9.2.5.

4.6 Limitations of the evaluation design

The main limitation to the evaluation design was the short period of time available to pilot the data collection forms and establish a robust pre-project dataset. Statistical comparisons of pre-project data with project data have not therefore been possible. Smoking status was inadvertently omitted from the clinical data record and may have been noted earlier in the project had there been a longer pilot period. As noted in section 5, timeframes were very tight at the start of the project due to the delay in passing the regulations, but also a finalised contract between NZSSD and the evaluation team.
A large evaluation of nurse and pharmacist independent prescribing in England was published in May 2011. This evaluation was discovered too late to better inform the development of the patient, team and GP surveys. Surveys developed from this English evaluation would have provided useful data for international comparison.

Issues to do with the availability and validity of the monitoring data have already been discussed. These limitations should be kept in mind when considering how the data have been interpreted against the expected project outcomes. Attributing improvement in short term patient outcomes (such as HbA1c) to DNS prescribing is not possible in an evaluative study; however, this may be amenable to measurement in an experimental study design that can statistically control for confounding variables.

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5 How was the DNS prescribing project implemented?

5.1 The project plan
The NZSSD were Health Workforce New Zealand’s preferred provider for implementing the diabetes nurse specialist prescribing project. A nurse practitioner in diabetes and related conditions was a member of the NZSSD Executive Committee and was asked to lead the project. The Project Manager required both clinical and sector credibility and she had a national reputation as a trusted leader in professional nursing issues and in diabetes care. Project management involved interaction, consultation and coordination with a range of stakeholders, including the Nursing Innovations Team of the Ministry of Health, Health Workforce New Zealand, Pharmac, Medsafe, the Nursing Council of New Zealand, engagement with consumers through Diabetes New Zealand, pharmacists, GPs and eventually with the Directors of Nursing and service leaders at each demonstration site, the participating diabetes physicians and diabetes nurse specialists. Personal and clinical support for the Project Manager came from the members of the NZSSD Executive Committee and the project reference group.

Much of the Project Manager’s work occurred ‘behind the scenes’ and was largely invisible to many of the project participants who described the transition to prescribing as ‘seamless’. The key tasks and timeframes the Project Manager was responsible for in the six months prior to the project start are outlined in the Project Plan (appendix 9.1.1) submitted to HWNZ in October 2010 and took place with the support and assistance of a Project Manager for the Ministry of Health team. The project came about with only minor deviation from the project plan except for the timeframes which were dependent on the awaited change to the Medicines Regulations and subsequent decision by the Nursing Council about the education requirements. Some of the issues associated with the key tasks were explored with the Project Manager when she was interviewed for this evaluation report and are briefly described next.

5.2 The communication plan
The communication plan worked alongside the project plan. It identified the key stakeholders, who would be communicated with, by whom, for what reason, and at what time. The communication strategy was an important influence on the success of the project and was planned well in advance. Examples of the communication strategies used follow:

- Pharmac provided advance information to pharmacies and GPs via the Clinician Newsletters, and when available, formally issued notification to all New Zealand pharmacies providing the names
and Nursing Council registration number of the 12 registered nurses practising in diabetes health who could officially prescribe a limited list of medicines and medical devices.

- Engagement with the consumer group Diabetes New Zealand. Members were informed about the project through an article written by the Project Manager for publication in the autumn 2011 edition of the quarterly ‘Diabetes’ magazine.
- Key facts ‘Q&A’ information sheets were written for consumers and health professionals that project participants could refer to and give away (see appendix 9.1.2).
- Flyers were stapled to all prescriptions provided by DNS informing pharmacists about the project and how to check the nurses’ registration number and authorisation on the Nursing Council website.
- Clinical champions at each site were appointed (usually the physician providing supervision for the nurses and a Director of Nursing). Their role was to speak on behalf of the project if approached by the media or external agencies.

5.3 Project dependencies

New regulations were necessary for DNS to legally prescribe medicines and were enacted on 21 March 2011, three weeks before the public launch of the project.6 The descriptor ‘Registered nurses practising in diabetes health’ clearly differentiated the scope of practice from the nurse practitioner scope, which has its own designated prescriber regulations.7 The supervision requirement in the regulations provided a guarantee of collegial medical support and formalised the case review requirements throughout the project.

The schedule of medicines in the regulations was crucial to enhancing nursing practice and improving access to care. It needed to include the useful and core range of glycaemic, lipid-lowering and anti-hypertensive medicines used to treat the multi-system disease associated with diabetes. There was considerable debate amongst the stakeholders about what to include or exclude from the schedule. Eventually 26 medicines were agreed to that are commonly used to treat the spectrum of glycaemic, cardiovascular and renal problems associated with diabetes.

The competence and qualification requirements for DNS prescribing are determined by the Nursing Council. Along with HWNZ and the Nursing Innovations Team at the Ministry of Health, the Council

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had published a discussion document called ‘Nurse prescribing in diabetes services’ in July 2010\(^8\), which invited submissions on specific medicines for registered nurses with the appropriate qualifications and experience to prescribe, and the qualifications, training and knowledge necessary to do so. Once the regulations had been passed, the Nursing Council published notice of the education requirements in the Gazette on 31 March 2011, ten days prior to the project start date. The requirements were for two level eight papers with content that includes pathophysiology, clinical assessment and pharmacology, and a six – 12 week supervised practicum.

There had been regular communication and face to face meetings between the Project Manager and the Nursing Council staff, but the requirement for a supervised practicum had not been anticipated for RN prescribing (it is a requirement for NP prescribing). The demonstration sites and participating DNS had already been selected by this time and not all the nurses had completed a prescribing practicum in their postgraduate study. A launch date of 11 April had been announced by HWNZ and meant that a practicum experience that would meet the Council’s requirements was designed and implemented on very short notice. Without established RN competencies for prescribing, the supervising prescribers and Project Manager determined the standard of practice and assessed each nurse as competent against those standards. The competence assessment form used at the end of the practicum and again at the end of the project is at appendix 9.1.5.

The nurses were required to apply to the Nursing Council for authority to prescribe in diabetes health and include evidence of their competence to prescribe. The project participants described these applications as straightforward due to the portfolio requirements for accreditation as diabetes nurse specialists with the NZNO, and case studies already prepared for academic course work.

### 5.4 Project set up

Meanwhile, in November 2010, the Project Manager on behalf of NZSSD and with assistance from a project support person, had developed and issued an expression of interest (EOI) document to the specialist diabetes services in each of the DHBs. Criteria had been developed for the EOI based on a ‘best guess’ basis about what the regulatory and education requirements for the nurses would be.

The pre-defined objective selection criteria for choosing the sites were based on the organisational support from the Director of Nursing and the management structure, a minimum of three DNS who

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had the appropriate professional and academic qualifications (one of which was the site leader), suitable diabetes physicians to supervise the nurses into a prescribing role, adequate patient volumes (no less than 40 consultations per nurse per week), and evidence of quality improvement activity.

A seven member panel comprising NZSSD executive and members, other nurses and doctors and a scientist reviewed the eight expressions of interest received. The panel used a weighted scoring system to assess a range of indicators which aided the decision about the selection of suitable demonstration sites.

5.4.1 The demonstration sites

Four District Health Board demonstration sites, Auckland, Hutt Valley, Hawke’s Bay and MidCentral, were chosen to participate in the project. All sites operate as hospital-based secondary care services offering both inpatient and outpatient care from multidisciplinary diabetes specialist teams. The teams comprise diabetes specialists/physicians and endocrinologists and diabetes nurse specialists; as well as various combinations of dieticians, staff nurses, podiatrists and part-time psychologists either on staff or outsourced. Joint paediatric and obstetric clinics are conducted. Most centres run peripheral clinics; Hawke's Bay has three, Mid Central one, and Auckland eight. Clinics are held with varying frequency depending on demand. Each DHB had a site agreement with the NZSSD which covered the project scope, timeframes, reporting and supervision requirements.

5.4.2 Participants in the project

Six doctors and twelve DNSs participated in the project. The profile of the participants affirms the group as highly experienced in specialist diabetes care. All DNS meet the Nursing Council of New Zealand education requirements for first time prescribers in diabetes health.9

Eleven nurses are accredited as diabetes nurse specialists with the New Zealand Nurses Organisation (NZNO)10; the twelfth is recently registered as a nurse practitioner in diabetes and related conditions. Nine DNS have post graduate education such as a post graduate certificate (n = 3), post graduate diploma (n= 2) or completed Masters degree (n = 4). Those with a Bachelors degree as highest qualification (n = 3) are currently enrolled in post graduate study completing postgraduate

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diploma or Masters degrees. Two of the doctors have a PhD or PhD equivalent and two are enrolled in a Masters degree.

5.4.3 Site preparation
An initial meeting in February was held in Palmerston North with all project staff to discuss the project plans, the supervision requirements, the schedule and reporting requirements. As well, the Project Manager visited each site, including each Director of Nursing. As a group, the Directors of Nursing made an important contribution to the smooth set up and running of the project, troubleshooting and managing many of the ‘invisible’ facets of the project when issues arose.

At the start of the project, communication with and information for the project participants was provided via a micro-site which was set up on the Health Improvement and Innovation Resource Centre (HIIRC) web site. Entry was restricted to the project participants and included a project documentation repository, background literature, and a discussion board for questions about the project and issues to do with data collection for monitoring and evaluation purposes. The site was regularly accessed at the start of the project, but communication between participants tended to be by direct email as the project progressed. The nurse or team leader for each of the sites did a great deal of ‘local’ site organisation and was the main vehicle for communication between the Project Manager and the rest of the team.

As the project progressed the Project Manager visited the DNS and physicians at each site each month, as well as the Director of Nursing. These face to face meetings were an important means of addressing issues as they arose, and of providing direct support. Another progress meeting with all project staff was held in Palmerston North in July.

5.5 How did the project work?
5.5.1 Context and delivery
Before the project started, prescriptions for patients were arranged by the DNS through the patient’s general practitioner or directly from the diabetes physician on site. Adjustments of insulin doses or oral hypoglycaemic medications were managed under standing orders and a random selection of cases audited by the physicians on a monthly basis. Recommendations for changes to or initiation of antihypertensive or lipid-lowering medications were previously communicated by letter to the patient’s GP; they were not managed under standing orders.

The process of generating a new prescription or getting a prescription revised was time consuming for the DNS and often meant delays of several days for the prescription to be written. The process was complex for the patient who had to wait to hear from the DNS that the prescription was ready to collect and where to collect it from. The process was time consuming for GPs too.

The purpose of the project has been to make better use of DNS skills and experience and streamline the prescription process for a range of diabetes-related medicines and equipment. DNS continue to manage patients referred to the diabetes centre as before, but are now able to prescribe diabetes-related medicines for the patients receiving their care.

### 5.5.2 Access criteria

Access criteria for the four diabetes centres is based on the National Referral Guidelines and Prioritisation Criteria, Version 1, October 2000, Authorised Elective Services, HFA and referrals are accepted from medical and nurse practitioners, and in liaison with the general practitioner. People accepted for referral are those with complicated diabetes needs who have not responded well to management in primary care. They include those with newly diagnosed type 1 diabetes, or type 2 where there is significant hyperglycaemia, ketonuria, or inter-current illness, or for diabetes in pregnancy, including gestational diabetes. At some centres patients are able to self refer.

### 5.5.3 Staff expectations

At the phase one interviews the project participants were asked what changes needed to happen for the project to start and about their expectations of the project. The transition to DNS prescribing was described as smooth, with leadership and good organisation seen by the participants as key factors. They acknowledged that a great deal of work behind the scenes had paved the way for the project: “I guess [the Project Manager’s] done all the hard work and [has] put everything in place and dotted the i’s and crossed the t’s ... got a lot of paperwork and things like that up and running first and made sure everyone knew what they were doing before it started” (DNS 3/2i).

The perception from the participating staff is that not much change was required to accommodate the project: “It’s not that different really. It’s just documenting it all and then actually doing the scripts” (DNS 4/2i). Setting up the regular clinical review meetings (a requirement of the project) was the main change for the physicians: “I mean basically things haven’t changed particularly except for their [the nurses] ability to prescribe. ... obviously we’ve now got the [case] review process ... which is not too dissimilar to what we were doing with the audit [of standing orders] previously” (Doctor 2/2i).
Regular clinical review was the means by which the DNS came “up to speed with the pharmacology that they’re prescribing” (Doctor 2/2i). The meetings involved structured discussions that were focussed on prescribing issues and were regarded highly by physicians and nurses alike. They were clear that the transition to safe prescribing required this level of support and were concerned that if RN prescribing were rolled out to other areas the same support might not be available. Clinical review is discussed further in this report in section 7.1.4.

Overall, participants expected the project to make things easier for the patients, but also for GPs, and eventually for other nurses too who may want to progress their career: “And I’m really hoping that it will be a career pathway for people [who] don’t want to do the whole nurse practitioner thing and this may satisfy their need and level of responsibility. And it does lift you up from the novice-beginner, absolutely, so I’m hoping that in the future we can see it as career progression” (DNS 2/2i).

### 5.6 Summary

The process of project implementation involved coordination, consultation and communication by the Project Manager with a wide range of stakeholders within the Ministry of Health and its associated organisations, the Nursing Council, health sector, and with diabetes consumers. Go ahead for the project was dependent on the regulations which would allow the Nursing Council to authorise DNS with the appropriate experience and education to prescribe diabetes-related medicines. The delay in the regulations led to last minute pressure to provide a suitable practicum experience for most of the nurses prior to the launch date for the project.

Nonetheless, for each of the participating sites project implementation was straightforward and smooth which was largely due to the planning work of the Project Manager. The provision of diabetes services to those who meet the referral criteria continued as usual, but with the advantage of a more streamlined process for patients who require a prescription. The apparent ease of project implementation at a practice level suggests the prescribing innovation is a logical solution to a previously awkward and time consuming process for staff and patients alike.
6 Population profile

This section describes the characteristics of the population who were seen by DNS during the project period and during the two-week pilot period which immediately preceded the project start. These data have been collated from the clinical data record of 1274 patients who were seen by DNS during this time.

The data describes a highly complex population of people with type 1 diabetes (n = 250), type 2 diabetes (n = 928) and gestational diabetes (n = 79). Ten women with type 1 diabetes were pregnant. Those with an ‘other’ category of diabetes (n = 13) make up the total patients with type reported. The time since first diagnosed with diabetes ranged from under a year to 56 years. Sixty seven percent have lived with diabetes between 5 and 25 years.

Fifty five percent of patients are female. The average age of patients was 56, ranging from 16 – 95 years. The majority are of European or New Zealand European ethnicity (54 percent) followed by 17 percent Maori, 17 percent Pacific, 10 percent Asian, and one percent other. There were a small number for whom ethnicity is unknown (2 percent).

Smoking status was recorded for only 45 percent of patients. Of these 54 percent have never smoked, 29 percent were past smokers and 17 percent currently smoke.

Table 1 shows the number of co-morbidities by category (34 percent of women with GDM had co-morbidities and their data are included). 204 patients (16 percent) had no co-morbidities and 69 percent had between 1 and 5 co-morbidities.

Table 1: Number of co-morbidities by category

<table>
<thead>
<tr>
<th>Condition</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>706</td>
<td>55</td>
</tr>
<tr>
<td>Dyslipidaemia</td>
<td>634</td>
<td>50</td>
</tr>
<tr>
<td>Obesity</td>
<td>362</td>
<td>28</td>
</tr>
<tr>
<td>Diabetic eye disease</td>
<td>324</td>
<td>25</td>
</tr>
<tr>
<td>Renal disease</td>
<td>311</td>
<td>24</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>230</td>
<td>18</td>
</tr>
<tr>
<td>Asthma/COPD</td>
<td>156</td>
<td>12</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>78</td>
<td>6</td>
</tr>
<tr>
<td>Foot problems</td>
<td>87</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>589</td>
<td>46</td>
</tr>
</tbody>
</table>

*totals more than 100%
There were 1234 patients (97 percent) who were already prescribed one or more medications when they entered the project; the mean for the group was 6 medications and ranged from 0 – 17. Table 2 shows the number of patients already prescribed insulin, oral hypoglycaemic, antihypertensive, lipid-lowering or other medicines when they entered the project.

Table 2: Number of patients already prescribed medications at project entry, grouped by drug category

<table>
<thead>
<tr>
<th>Number of patients already prescribed</th>
<th>Category of drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>891 (70)</td>
<td>Insulin</td>
</tr>
<tr>
<td>700 (55)</td>
<td>Oral hypoglycaemic</td>
</tr>
<tr>
<td>823 (65)</td>
<td>Antihypertensive</td>
</tr>
<tr>
<td>763 (60)</td>
<td>Lipid-lowering</td>
</tr>
<tr>
<td>900 (71)</td>
<td>Other</td>
</tr>
</tbody>
</table>

*totals more than 100%

6.1 Summary

The data describe a complex patient group who not only have diabetes, but a high level of co-morbidity for which they are prescribed multiple medications. These patients are referred to the diabetes centres usually by general practitioners because they have complicated diabetes needs which have not responded well to management in primary care.
7 Evaluation findings and conclusions

The following sections present the four evaluation questions in turn and analysis of the data collected to inform the evaluative conclusions made for each question. Each section begins with a table that outlines the evaluation criteria, sources of data and method of data collection, and concludes with a determination of merit statement which is based on the rubric of outcome standards presented last.

7.1 What is the quality of, how safe and how clinically appropriate is DNS prescribing?

<table>
<thead>
<tr>
<th>Evaluation criteria</th>
<th>Key sources of data</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events</td>
<td>Incident forms</td>
<td>Assessment for adverse outcome</td>
</tr>
<tr>
<td></td>
<td>Selection of patient notes</td>
<td>Clinical audit</td>
</tr>
<tr>
<td>Hospitalisations related to glycaemic control</td>
<td>Patient report</td>
<td>Prescribing log</td>
</tr>
<tr>
<td></td>
<td>Selection of patient notes</td>
<td>Clinical audit</td>
</tr>
<tr>
<td>Regularity of clinical review</td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td>Appropriateness of assessment and</td>
<td>Selection of patient notes</td>
<td>Clinical audit</td>
</tr>
<tr>
<td>prescribing decisions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescriptions meet legal requirements</td>
<td>Selection of prescriptions</td>
<td>Quality audit</td>
</tr>
<tr>
<td>Patient outcomes</td>
<td>DNS</td>
<td>Clinical record</td>
</tr>
</tbody>
</table>

7.1.1 Adverse events

The Project Manager reported there were no incidents documented on hospital incident forms that resulted in adverse events for patients.

7.1.2 Clinical audit

A total of 117 sets of patient notes and prescriptions were audited during August and September by the participating physicians. Prescribing decisions were assessed as clinically appropriate with the exception of the five instances noted in table 2 (each concerned different nurses):

Table 3: Questionable prescribing identified in the clinical audit

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t know if appropriate</td>
<td>Notes say simvastatin is 20mg nocte - I presume tx by GP. No letter re. suitability of this pre-pregnancy. Notes say Metformin 250 d. Script says Metformin 500 d.</td>
</tr>
<tr>
<td>Don’t know if appropriate</td>
<td>1. Poor control but unclear reason for changing insulin from Penmix 30 to Humalog Mix25. 2. Though it appears patient was not taking prescribed dose.</td>
</tr>
<tr>
<td>Don’t know if appropriate – missing data</td>
<td>DM1 with insulin pump, hypos, obesity and high HbA1c and high cholesterol. Started with simvastatin. Would probably not require this treatment and better with diet and glycaemic control and risk calculation charts discussed (except if family history of FH). Family history data missing.</td>
</tr>
<tr>
<td>Dose not appropriate (not funded)</td>
<td>QID glucose monitoring strips prescribed but patient not on insulin or SUs – therefore not funded.</td>
</tr>
<tr>
<td>Dose not appropriate</td>
<td>Patient having frequent overnight hypos. Dose at night was not decreased accordingly.</td>
</tr>
</tbody>
</table>
Two clinically significant adverse consequences were noted, both of which were for hypoglycaemia; appropriate advice and treatment was given. Laboratory tests were ordered either appropriately or were not required. There was one instance of an unexpected outcome of hyperglycaemia, and patient follow-up was appropriately arranged with the GP. There were no adverse events identified in the clinical audit relating to nurse prescribing that led to a hospital presentation or admission.

Although the clinical audit supports almost all DNS prescribing decisions as clinically appropriate, GPs who responded to the survey indicated they usually or always agree with insulin or oral hypoglycaemic prescribing decisions, but tend to agree less often with decisions about antihypertensive or lipid-lowering medications. Several DNS pointed out at interview that there had never been communication back to the diabetes centre from a GP that challenged a prescribing decision: “In fact I haven’t really heard from them at all” (DNS 2/3i). The number of prescriptions or revisions for antihypertensive and lipid-lowering medications was only a small portion of the overall prescribing work done by the DNS, with most therapy already initiated in primary care.

7.1.3 Hospitalisations related to glycaemic control
The prescribing log identified 27 instances of hospitalisation for reasons relating to glycaemic control. Each of these were investigated further by the physicians at each site and determined to be unrelated to any DNS prescribing decision.

7.1.4 Clinical review
Formal supervision at clinical review meetings took place in each of the demonstration sites with the diabetes physician and the DNS usually for an hour and followed the format outlined in the supervision document designed for the project (appendix 9.1.8). Meetings were initially weekly, then amended to two weekly by the project physician as DNS confidence grew, and towards the end of the project, monthly. The Project Manager was notified when amendments were made.

Prescribing decisions made during the week were discussed at clinical review meetings, as well as revision of the action and interaction of drugs, and discussion of relevant journal articles. At interview the DNS talked about the importance of clinical review because of the “giant step between having the theoretical knowledge and putting things into practice by actually writing the prescription and giving it to the person” (DNS 2/4ii). Physicians and DNS expressed appreciation for the mutual exchange of knowledge at the clinical review meetings and the “tangible” support formal review offered.
Informal supervision also took place on a one-to-one basis and provided an opportunity to address day to day needs for advice, guidance and support. Formal review and one-to-one opportunities were extra work for all staff, but especially the doctors who tend to have limited hours working for the diabetes service and have little or no cover when absent on leave. There appeared, however, to be considerable good will and collegiality in relation to these exchanges, with doctors making themselves available outside their designated ‘diabetes’ hours to provide support: “I can page him. We do try not to because sometimes we know that he’s got a really heavy workload, so we try not to, but if we needed to then I would page him and just discuss it and he’s quite happy to do that” (DNS 1/1i).

The prescribing log indicates that most prescribing decisions took place independently (94.1 percent, n = 3200), 2.6 percent (n = 89) were dual consultations and 3.1 percent (n = 107) following consultation with an authorised prescriber. The data are unable to differentiate if consultation decisions occurred at the clinical review meetings or by specific request. The data, both qualitative and quantitative, clearly indicate that collaboration took place when DNS felt it was necessary.

### 7.1.5 Quality of prescriptions

A total of 229 prescriptions written by DNS during August were audited by the participating doctors against seven quality criteria. There were nine errors noted (3.9 percent) most of which were minor. Six errors were administrative omissions such as a missed signature, registration number, date, or amount to dispense. There were two instances where the frequency of the drug dose was not stated and one where the dose for an antihypertensive medication was written incorrectly.

### 7.1.6 Patient outcomes

The baseline mean blood chemistry, weight and blood pressure measurements for all patients with data available at project entry are presented in Table 4. Given there were no study baseline or exit tests the best option to determine clinical outcomes was to examine the longitudinal data available. Thus for those patients with repeat measures recorded, the earliest measures available have been compared with the last measures available. Table 4 and Figure 1 show that over an average of 100 days (range 8 to 250 days) most of the 10 measures remained stable or improved. Notable was the improvement in mean glycaemic levels. Exceptions were the mean weight and the median ACR for males, both of which increased.
Table 4: Patient outcome data

<table>
<thead>
<tr>
<th></th>
<th>All patients with data at study entry</th>
<th>Patients with longitudinal clinical data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>n</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>827</td>
<td>93.4</td>
<td>108</td>
</tr>
<tr>
<td>BP systolic (mmHg)</td>
<td>840</td>
<td>131</td>
<td>150</td>
</tr>
<tr>
<td>BP diastolic (mmHg)</td>
<td>837</td>
<td>75</td>
<td>149</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>1091</td>
<td>9.2</td>
<td>307</td>
</tr>
<tr>
<td>HbA1c (mmol/mol)</td>
<td>1091</td>
<td>77</td>
<td>307</td>
</tr>
<tr>
<td>eGFR/GFR* (mls/min)</td>
<td>970</td>
<td>66</td>
<td>206</td>
</tr>
<tr>
<td>Total cholesterol (mmol/l)</td>
<td>899</td>
<td>4.4</td>
<td>181</td>
</tr>
<tr>
<td>HDL (mmol/l)</td>
<td>893</td>
<td>1.2</td>
<td>180</td>
</tr>
<tr>
<td>LDL (mmol/l)</td>
<td>841</td>
<td>2.4</td>
<td>153</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Median (Range)</th>
<th>Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACR* (mg/mmol):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>327 (0.1-698)</td>
<td>61 (0.1-342.0)</td>
</tr>
<tr>
<td>- Female</td>
<td>365 (0.1-972)</td>
<td>53 (0.9-466.7)</td>
</tr>
<tr>
<td>Creatinine (µmol/l)</td>
<td>997 (1-1453)</td>
<td>211 (1-928)</td>
</tr>
</tbody>
</table>

* Where eGFR/GFR was recorded as >60 or >90, 61 or 91 respectively was computed
# Where ACR was recorded as <1 or negative, 0.9 or 0.1 respectively was computed

Longitudinal comparison of mean clinical measures

Figure 1: Longitudinal comparison of averaged clinical measures
7.1.7 Determination of merit

Overall, the findings show that DNS prescribing is safe, of good quality, and clinically appropriate.

Analysis of the data shows there were no adverse events or hospitalisations for patients during the project period that can be attributed to DNS prescribing. Clinical audit findings by the project physicians determined that prescribing decisions were clinically appropriate. In four instances identified in the audit, the information in the notes was insufficient for a determination that the prescribing decision was appropriate, and in one instance an evening insulin dose was questioned.

Patient outcomes remained stable throughout and showed an overall improvement in HbA1c.

Ninety-six percent of audited prescriptions complied with legal requirements. Planned clinical review took place weekly initially and reduced to monthly as DNS confidence grew.

Outcome standards:

<table>
<thead>
<tr>
<th>Rating</th>
<th>No adverse events during project</th>
<th>≤1 percent of hospitalisations are related to prescribing</th>
<th>Planned clinical review occurs at least monthly</th>
<th>Clinical audit findings support all prescribing decisions made</th>
<th>≥95 percent of audited prescriptions comply with legal requirements</th>
<th>Patient outcomes remain stable or improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>≤3 adverse events during project</td>
<td>≤3 percent of hospitalisations are related to prescribing</td>
<td>Planned clinical review occurs 4 – 6 weekly</td>
<td>Clinical audit findings support almost all prescribing decisions made</td>
<td>≥93 percent of audited prescriptions comply with legal requirements</td>
<td>Patient outcomes remain stable</td>
</tr>
<tr>
<td>Good</td>
<td>≤5 adverse events during project</td>
<td>≤5 percent of hospitalisations are related to prescribing</td>
<td>Ad hoc clinical review occurs</td>
<td>Clinical audit findings support most of the prescribing decisions made</td>
<td>≥90 percent of audited prescriptions comply with legal requirements</td>
<td>Patient outcomes deviate minimally from baseline</td>
</tr>
<tr>
<td>Acceptable</td>
<td>&gt;5 adverse events during project</td>
<td>&gt;5 percent of hospitalisations are related to prescribing</td>
<td>Clinical review occurs only on request</td>
<td>Clinical audit findings raise multiple areas of concern</td>
<td>&lt;90 percent of audited prescriptions comply with legal requirements</td>
<td>Patient outcomes deviate significantly from baseline</td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.2 What is the contribution of DNS prescribing to an effective specialist diabetes service?

<table>
<thead>
<tr>
<th>Evaluation criteria</th>
<th>Key sources of data</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service usage patterns at diabetes centres</td>
<td>Site records</td>
<td>Throughput data</td>
</tr>
<tr>
<td></td>
<td>DNS</td>
<td>Prescribing log</td>
</tr>
<tr>
<td></td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td>Interruptions for other practitioners</td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td></td>
<td>GPs, Team</td>
<td>Surveys</td>
</tr>
<tr>
<td>Delay in initiation of treatment</td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td></td>
<td>Patients</td>
<td>Survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interviews</td>
</tr>
<tr>
<td>Quality of DNS consultation with patients</td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td></td>
<td>Patients</td>
<td>Survey/Interviews</td>
</tr>
<tr>
<td></td>
<td>Team</td>
<td>Survey</td>
</tr>
</tbody>
</table>

7.2.1 Service usage patterns

Results from analysis of the service usage patterns of physicians, prescribing DNS and non-prescribing DNS show a small but steady total increase in mean number of patients seen per day across all sites during the project period. The March (pre-project) mean compared to the September mean indicates an increase of 4.3 patients seen per day across all sites. This gain is modest and is likely to reflect the pattern of variance normally seen from month to month in any given year. What is significant is that despite the demands of the project itself, service levels have not reduced at all.

The mean time spent in clinic consultations was 32.6 minutes (range = 1 - 150). When compared with the pre-project pilot data (M = 33.8 minutes), the mean difference is 1.16 minutes less. The difference was expected to be greater in light of DNS reports that they now spend more time on clinic consultations. The comparisons for non-clinic contact time with patients (telephone, home visit, email, fax or inpatient) are similarly small, but also less (M = 1.82 minutes). There were also minimal differences between the two periods in the mean time spent on patient related administration. Useful conclusions from this data in relation to service usage change are not able to be made as the measured change of less than two minutes is likely to be clinically insignificant.

At interview DNS report increased attention to following up on patients, and the quantitative data does seem to support a thorough approach, although the pilot period was too short to reasonably quantify a difference in number of contacts with patients between the two periods. The number of contacts (all types) ranged from 1 to 30 with an average of three to four contacts per patient.

The type of contact made during the project was comparable to the pre-project pattern. Fifty-one percent (n = 1734) took place in clinic; 39.5 percent (n= 1336) by telephone; and 6.1 percent (n =
203) by email or fax. Home visits, GP clinics and inpatient work makes up a small percentage of patient contact (3.2 percent). DNS spend about as much time in direct clinic contact as they do via the telephone or email or fax. Patients particularly mentioned and liked the availability of DNS by email.

What can be said (but not measured) about a change in service usage pattern is the distribution of patient complexity across the physicians, prescribing DNS, non-prescribing DNS and GPs. Where patients were previously referred to a physician for follow-up, the prescribing DNS are now fully managing them, thereby improving the workload of the physicians: “And I put my hand up and say ‘No, no, no. They do not need to see a physician; this patient does not need to see a physician!’ And I would say that probably happens three or four times a week ... and I question them and say I want you to give me two good reasons why this person has to see a physician. And they’re never good reasons. So I reckon I have been able to, after discussion with them, prevent more patients coming on to the physician waiting list for an appointment” (Doctor 4/1ii).

The prescribing DNS too are beginning to realise that some of their work could be managed in primary care without the involvement of a specialist service: “I think it’s about us actually letting go of some of the stuff that we’ve done in the past and using our potential, but that means then realising the potential of others who [can] do the work we might have done in the past” (DNS 3/2ii).

7.2.2 Interruptions for other practitioners

Prior to the project some sites had relied almost exclusively on GP provision of prescriptions, and others relied more on the doctors employed by the diabetes centres. It was clear that physicians were now writing fewer prescriptions for nurses in sites where they had previously provided most of the prescriptions. Little had changed for physicians at sites where GPs had provided the prescriptions.

Physicians in all sites experienced interruption due to the supervision and project requirements (i.e. one-to-one case review with DNS, education and auditing). One physician commented that “one communication was just replaced by another communication so instead of being interrupted to write a prescription we were interrupted to give that level of education, which was an extra” (Doctor 3/1ii).

At interview, some doctors anticipated they would have fewer interruptions when the project was over: “But from the purely clinical point of view of their practice, then I think it’s reduced the time and frequency of them [the DNS] having to consult” (Doctor 2/2ii).
Certainly the prescribing log data indicates (as noted in 7.1.4) that the majority of prescribing decisions took place independently. Of the independent prescribing decisions, 59 percent (n = 1898) were for changes to or initiation of insulin(s), and 11.3 percent (n = 340) were for changes to or initiation of one or more oral hypoglycaemic medications. Titration of these medicines was previously managed under standing orders and would not necessarily have involved a physician on the day. Initiation (or a repeat) prior to the project did require a physician or GP to supply a prescription. Of the prescriptions for insulin during the project, 15.8 percent (n = 318) were for new medication; and of the oral hypoglycaemic medicines, 28.9 percent (n = 111) were new. These percentages do suggest fewer interruptions for doctors in both primary and secondary services when pharmacological control of blood glucose is required. Fifty-four percent (n = 14) of the GP survey respondents agreed there were important or extremely important benefits from DNS prescribing in relation to fewer interruptions to their day.

Lipid-lowering and antihypertensive medicines were not previously managed under standing orders, but were prescribed or revised less frequently overall. There were 3.3 percent (n = 113) lipid-lowering prescribing decisions, and 4.4 percent (n = 150) antihypertensive decisions. Note that 65 percent of patients were already prescribed antihypertensive medicines, and 60 percent prescribed lipid-lowering medicines when they entered the study (see Table 2: Number of patients already prescribed medications at project entry, grouped by drug category).

An unexpected evaluation finding was for prescribing DNS who reported they were interrupted for advice by the non-prescribing nurses more often since the project had started; this was perceived positively especially in sites where doctors were scarce. In some sites, the prescribing DNS would write prescriptions for the non-prescribing nurses. When this issue arose in the phase two interviews that took place in September, it was discussed with the Project Manager and the NZSSD project reference group who determined that each prescribing DNS would need to see the patient and make their own assessment before providing a prescription for pharmacological agents, and document the decision appropriately.

### 7.2.3 Initiation of treatment

The frequency of prescribing decisions for lipid-lowering and antihypertensive medicines increased as the project progressed and DNS confidence grew (see Figures 2 and 3).

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12 Note that the April-May data starts from 11 April.
The ‘revised’ category in Figures 2 and 3 refer to changes in dose, frequency or to a different drug within the class. Although the overall number of prescriptions for these classes of drugs was few, doctors and especially DNS were pleased that the regulations included them on the schedule. Instead of only writing to a GP about a patient’s elevated lipids or blood pressure with the suggestion that treatment be initiated or intensified, the nurses where able to start treatment, arrange appropriate blood tests and follow-up in clinic to assess if the medication at the prescribed dose was making a difference and not causing untoward side effects: “Well in the past we would often write back to GPs saying the patient’s blood pressure was elevated, can you recheck, or note
patient’s cholesterol is elevated can you review? And half the time you kind of know they’re not going to, or the patient isn’t going to go back, or you see them six months later or 12 months later and they’re on the exact same medication and you think, well they clearly haven’t been reviewed. Whereas if we see them, we can instigate something or make a change. So I would say that makes us more effective” (DNS 3/3ii).

The ‘failure of healthcare providers to initiate or intensify therapy when indicated’ is defined in the literature as therapeutic inertia.13 What is important about the ability of DNS to initiate or intensify treatment is that people tend to stay on a medication once it’s been started: “once people are on treatment it seems to continue” (Doctor 3/1ii). DNS prescribing reduces therapeutic inertia by providing treatment that conforms to evidence-based guidelines, and contributes to a more effective diabetes service by improving the long term outcomes of people with diabetes.

7.2.4 Quality of consultation

The DNS and doctors at interview attributed the prescribing project with forcing the nurses to “up their game”. By this they meant that the nature of the nursing consultation had changed to be more comprehensive and to proactively manage a wider range of medical outcomes that make a difference for people with diabetes. Patients too had noticed that consultations were more focussed: “She was more in-depth with me, followed my case and followed it all the way through and knew exactly all about me, what was happening to me” (Patient interview 2). However, a comprehensive consultation need not necessarily lead to the generation of a prescription: “It’s looking at people’s regimens and thinking about them. I mean you may not necessarily prescribe anything very much but if you look at them critically and assess whether they’ve met the government guidelines and the targets and decided for yourself that they have, then to me that’s the same kind of intellectual process as actually changing something and prescribing” (Doctor 1/1ii).

Diabetes nurse specialists and responses from the team survey are clear that the responsibility for prescribing decisions contributes to DNS paying more detailed attention to laboratory results; they make a point of reviewing previous results, track trends and look forward with confidence to the next results to assess the value of changes made to treatment plans. The attention to detail was described by DNS as improving the quality of consultations with patients: “The patients are getting a much better service really because it’s forced us to slow down and think more about quality rather than quantity. It’s been challenging because the quantity of work hasn’t abated but the quality of the

work that we’re doing, I feel quite strongly, has improved. So people are getting better care more quickly. So things we might have otherwise sent back to the GP to do, that we’re undertaking to do” (DNS 3/2ii).

Follow-up with patients was also more thorough as DNS wanted to see the effect of prescribing decisions on patient outcomes. This is reflected in the prescribing log data about the number of contacts with patients reported in section 7.2.1. The few patients who had 20 or more contacts with DNS during the project period were all being intensively monitored for insulin titration, and the contacts were mostly by telephone or email.

7.2.5 Determination of merit

Overall, the evaluation findings suggest that DNS prescribing does contribute to an effective specialist diabetes service, but short time frames did not enable productivity gains to be measured. Analysis of the data shows that service usage patterns and feedback from clinicians indicate the available workforce is well utilised, with fewer referrals to diabetes physicians from DNS who are now able to deal with more complex patients themselves. Diabetes physicians have fewer interruptions to their work for requests for prescriptions, there is prompt initiation of treatment for the co-morbidities associated with diabetes, and DNS consultations are reported by patients, project participants and team members to be more in-depth.

Outcome standards:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Service usage patterns indicate excellent use of workforce and fewer referrals to consultants from DNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Consultants and GPs report fewer interruptions due to DNS prescribing</td>
</tr>
<tr>
<td></td>
<td>Prompt initiation of treatment</td>
</tr>
<tr>
<td></td>
<td>Significantly more in-depth patient assessment by DNS</td>
</tr>
<tr>
<td>Good</td>
<td>Service usage patterns indicate good use of workforce and fewer referrals to consultants from DNS</td>
</tr>
<tr>
<td></td>
<td>Consultants and GPs report fewer interruptions due to DNS prescribing</td>
</tr>
<tr>
<td></td>
<td>Few delays in initiation of treatment</td>
</tr>
<tr>
<td></td>
<td>Somewhat more in-depth patient assessment by DNS</td>
</tr>
<tr>
<td>Acceptable</td>
<td>Service usage patterns indicate acceptable use of workforce and similar referrals to consultants from DNS</td>
</tr>
<tr>
<td></td>
<td>Consultants and GPs report same level of interruptions due to DNS prescribing</td>
</tr>
<tr>
<td></td>
<td>Delays are comparable to pre-project initiation of treatment</td>
</tr>
<tr>
<td></td>
<td>No change in patient assessment by DNS</td>
</tr>
<tr>
<td>Poor</td>
<td>Service usage patterns indicate poor use of workforce and more referrals to consultants from DNS</td>
</tr>
<tr>
<td></td>
<td>Consultants and GPs report increased interruptions due to DNS prescribing</td>
</tr>
<tr>
<td></td>
<td>Significant delay in initiation of treatment</td>
</tr>
<tr>
<td></td>
<td>Rushed patient assessment by DNS</td>
</tr>
</tbody>
</table>
7.3 Is DNS prescribing acceptable to patients, and what are patients’ experiences of DNS prescribing?

<table>
<thead>
<tr>
<th>Evaluation criteria</th>
<th>Key sources of data</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timely access to advice and medicines</td>
<td>Patients</td>
<td>Survey &amp; interviews</td>
</tr>
<tr>
<td>Number of patient visits to GP, hospital or DNS for scripts</td>
<td>Patient report</td>
<td>Prescribing log</td>
</tr>
<tr>
<td>Patient costs related to getting medicines (fees, travel)</td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td></td>
<td>Patients</td>
<td>Survey</td>
</tr>
<tr>
<td>Patient confidence in DNS knowledge and prescribing decisions</td>
<td>Patients</td>
<td>Survey &amp; interviews</td>
</tr>
<tr>
<td>Convenience and time savings for patients</td>
<td>Patients</td>
<td>Survey &amp; interviews</td>
</tr>
<tr>
<td></td>
<td>DNS/physicians</td>
<td>Interviews</td>
</tr>
<tr>
<td></td>
<td>GPs</td>
<td>Survey</td>
</tr>
<tr>
<td>Patient satisfaction with the quality of consultations with DNS</td>
<td>Patients</td>
<td>Survey &amp; interviews</td>
</tr>
</tbody>
</table>

7.3.1 Access to medicines

Patient survey and interview responses suggest it is the availability of the DNS in the diabetes centres that improves access to medicines, not just their ability to prescribe. Patients appreciated how easy it was to get timely advice just by making a telephone call or emailing. The difference patients noticed between doctor and DNS consultations could be attributed to all DNS consultations and not just those authorised to prescribe. That is, DNS in general take the time to work closely with patients to help them understand how the medicines work, discuss side effects, and listen to patient concerns.

The views of health care professionals about patient access to services are discussed in section 7.4.5

7.3.2 Prescriptions from other providers

Prescriptions were obtained from providers other than DNS and the diabetes centre physicians during the project in 221 instances. The GP was the most common source (n = 192). Other sources were on discharge from hospital (n = 11), the renal team (n = 4), a cardiologist and hospice (n = 1 respectively). In 12 instances a prescription was received by another provider but no further detail was provided.

There were times when a DNS referred the patient back to their GP for a complete medical review and did not provide a prescription themselves; providing a prescription would have been
inappropriate as it would delay the GP visit. Other examples of reasons for referral back to the GP were because the DNS was not authorised to provide all the medications the patient needed, or the patient was planning to see their GP shortly, or agreed to see their GP when the blood test results were reported.

The following drugs DNS are not authorised to prescribe were provided in a dual consultation with an authorised prescriber (usually a consultant): beta blockers, exenatide, diltiazem, maxalon, iron, ondansetron, ventolin, oral antibiotics, tictotil, naproxen, aspirin, and allopurinol. In one instance a letter was written to a GP suggesting the patient commence pioglitazone.

7.3.3 Convenience and time savings

Ninety-five percent of patient survey respondents indicated it is ‘definitely more convenient’ to get a prescription from a DNS than from a specialist or GP, saying they “didn’t have to wait for the doctor to be available just to sign when it was already explained by the nurse” (Patient survey response). The importance of convenience was reiterated repeatedly in the short answer survey responses, and also in the follow up telephone interviews: “For me its convenience. Because the thing is with the specialist doctors, you generally only see them every six months to a year, but with the nurses it’s much easier to get in to see them” (Patient interview 17).

Convenience and the cost associated with getting a prescription from a GP were often linked by respondents, who also made mention of the added cost associated with taking time off work to pick up a prescription from a GP: “I think it was really good. You don’t have to make a second trip somewhere else and take more time off work and all that. It was so much more convenient, because you can talk about the different things and then they can write the script then and there” (Patient interview 18). “Time is money. I have children at school that I have to get back to pick up, and things like that, and if I’m hanging around and hanging around it was definitely a big thing. It [the consultation] was still fresh in my mind and it was done” (Patient interview 9).

There was also a well supported view in the GP and team survey data that DNS prescribing brings important or extremely important benefits in relation to reducing the delay for patients receiving a prescription.

7.3.4 Patient costs

Although many GPs will arrange for a repeat prescription without seeing the patient, there is usually a prescription charge to be paid and a fax charge if the prescription is faxed to a pharmacy (charges
vary between practices and pharmacies). A typical patient response is that a prescription from a DNS is “much more convenient, means I can avoid a second unnecessary trip to the doctor for just a script and the expense of seeing a doctor just for a repeat prescription or just because I have had to increase my insulin dose slightly” (Patient survey response).

Short answer patient survey responses (n = 31) and the patient interviews repeatedly mentioned that no costs or payment for prescriptions were an important difference between receiving a prescription from a GP and a prescribing DNS: “But the other thing is cost. My GP, it costs me a lot of my money even if I ring up and ask for a script” (Patient interview 17).

7.3.5 Patient confidence in DNS prescribing
There were 89 people who had received a prescription from a DNS and responded to the patient survey. All indicated they were happy to have a DNS prescribe their medications, except two people who prefer a doctor to prescribe and one who thinks it best if the nurse first checks with a doctor. Ninety-nine percent of respondents did not have any concerns about receiving a prescription from a DNS. Ninety-nine percent thought the nurses were either extremely knowledgeable about diabetes medications (n = 71) or very knowledgeable (n = 16). Similarly, 97.8 percent were extremely confident (n = 56) or very confident (n = 28) that the DNS had made the best prescribing decision for them. All except one, who was unsure, indicated they would go to a DNS in the future for a prescription, and two skipped the question.

Short answer responses in the patient survey supported the high level of confidence in the nurses: “I would say it’s better to receive the nurses input, as all she does is diabetes and [she is] generally more on top of the situation than my GP” (Patient survey response). There was also confidence expressed that if a prescribing DNS was unsure, he/she would readily seek advice: “What impressed me about the nurse I was dealing with, there was one issue that came up, and she said she didn’t think she should deal with it and she’d refer to it to one of the diabetes specialists and get back to me. And I had a response probably within two hours of leaving the hospital. And that was really good” (Patient interview 15).

7.3.6 Patient satisfaction with the quality of care
Qualities considered to be important when receiving a prescription from a DNS by respondents to the patient survey were (in order of importance): friendliness, clear explanations about the medications and how they work, having someone who listens to me, a skilled and competent
practitioner, a thorough assessment of my needs, having someone who is approachable and lastly, training and qualifications.

Some patients stated there was no difference between receiving a prescription from a GP and DNS (n = 10), but other short answer responses identified many of the above qualities as important differences. Indeed the survey may have primed the respondents to these factors. However, a consistent feature in the patient interviews which took place a number of days after the survey completion was the importance of the DNS listening to the patient: “... and actually listen to me and spend the time with me and my concerns, and not just five minutes and out the door and next. She spent the time and listened to my concerns. She came up with some suggestions and we went from there” (Patient interview 9).

When asked ‘what differences are there for you now that your nurse can prescribe your diabetes medications?’ a patient attributed the proactive approach of the DNS to the responsibility that comes with prescribing: “I find the process far more proactive than it used to be and I think that’s through taking ownership of the whole issue” (Patient interview 1).

Nurse prescribers demonstrated evidence based practice when advising patients. For example, a patient who was interviewed explained his concern about the ‘adverse’ effects of one of the oral medications he was prescribed elsewhere and the various answers to questions he’s since received. He described the interaction with the DNS as follows: “I said this is what I’ve been told, and she said there was a body of thought going down that track. She produced a number of documents and said ‘take a look at these. There is a strong body of thought to support the other move’. And there was nothing defensive, nothing like ‘I’m right, go and do it’” (Patient interview 15).

Diabetes nurse specialist use of evidence to support practice is a marker of quality that was noted by patients and was seen to contrast with their usual primary care provider. A common thread in the patient interviews and survey responses was that the DNS were “competent in their area of expertise and up-skilling continually in this area, giving them a specialist insight into diabetes, whereas a general practitioner may or may not be in a position to keep up with all the new clinical data on diabetes and prescribing” (Patient survey response).

7.3.7 Determination of merit

Overall, the evaluation findings are that DNS prescribing is acceptable to patients who indicate they are highly satisfied with the change. The patient experience of DNS is that they are extremely
knowledgeable, and they have high levels of confidence in DNS prescribing decisions and the quality of the consultations DNS provide. They are happy for DNS to prescribe their diabetes-related medicines, report they have no concerns and that they would return to a DNS for a prescription in the future.

While the quality of the consultations with DNS featured clearly in the data, satisfaction is especially related to the convenience of DNS prescribing, that it saves patient’s time and they experience fewer delays waiting for a prescription. These factors contribute to a cost effective service for patients. Most patients prefer to seek diabetes-related prescriptions from DNS during the episode of care with the diabetes centre because there are usually fewer costs associated with receiving a prescription.

**Outcome standards:**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Patients report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Excellent access to DNS; Definitely fewer costs associated with receiving a prescription; Extremely high levels of confidence in DNS knowledge and prescribing decisions; More convenient and time saving with fewer delays; Extremely satisfied with the quality of DNS consultations; Happy for DNS to prescribe/would return. Prescriptions for diabetes related medicines are sought from DNS during episode of care where appropriate.</td>
</tr>
<tr>
<td>Good</td>
<td>Good access to DNS; Usually fewer costs associated with receiving a prescription; High levels of confidence in DNS knowledge and prescribing decisions; More convenient and time saving with fewer delays; Very satisfied with the quality of DNS consultations; Happy for DNS to prescribe/would return. Prescriptions for diabetes related medicines are usually sought from DNS during episode of care where appropriate.</td>
</tr>
<tr>
<td>Acceptable</td>
<td>Acceptable access to DNS; Little change to costs associated with receiving a prescription; Moderate levels of confidence in DNS knowledge and prescribing decisions; No change to convenience and time savings or delay; Satisfied with the quality of DNS consultations; Acceptance of DNS prescriptions/ unsure if would return. Prescriptions for diabetes related medicines tend to be sought from DNS during episode of care where appropriate.</td>
</tr>
<tr>
<td>Poor</td>
<td>Poor or difficult access to DNS; More costs associated with receiving a prescription; Low levels of confidence in DNS knowledge and prescribing decisions; Less convenient / time savings, increased delay; Dissatisfied with the quality of DNS consultations; Prefer doctor to prescribe. Prescriptions for diabetes related medicines sought elsewhere during episode of care with DNS.</td>
</tr>
</tbody>
</table>
7.4 What are the views of health care professionals?

<table>
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<tr>
<th>Evaluation criteria</th>
<th>Key sources of data</th>
<th>Method</th>
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<tbody>
<tr>
<td>Views of DNS, physicians, team members, &amp; GPs</td>
<td>DNS/physicians Team members GPs</td>
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<td>MDT functioning</td>
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<td>DNS satisfaction with their extended role, autonomy and responsibility</td>
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<td>Patient access to services</td>
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7.4.1 Multi-disciplinary team functioning

A substantial body of literature has established the connection between interdisciplinary collaboration and the ability to provide high quality and safe care.\(^\text{14}\) A well functioning team environment therefore plays an important role in supporting safe practice, and in this instance safe DNS prescribing. The team in the diabetes centres includes physicians, other medical staff in the department, managers, the non-prescribing nurses, and GPs. The extension of the team to primary care is an important aspect of the team environment as GPs both refer to the service in the first instance and provide ongoing care during and after the episode of care with the DNS.

All but six GP respondents to the survey with experience of DNS providing prescriptions for patients attending their practice where happy for DNS to prescribe diabetes-related medications (n = 28) and two had concerns. Short answer comments about concerns related to wanting communication about DNS prescribing decisions which were ‘ideally the same day’ and about the importance of follow-up to ensure ‘treatment yields better results of HbA1C and outcome’. GPs overall rated communication of prescribing decisions from DNS as either good, very good or excellent (89.3 percent); communication was rated as not very good by 10.7 percent. A DNS at interview stated the level of communication with GPs had changed during the project and the challenge had been to consider “at what point do I hand this over to primary care? And that for me has been the challenge, about making sure that I’m communicating to the primary care provider about what it is I’m doing” (DNS 3/2ii).

Survey data from team members of DNS indicates all respondents (n = 19) support DNS prescribing but five have concerns. There is a well supported view that DNS prescribing has important or extremely important benefits for improved diabetes management, improved continuity and quality of care, and better use of DNS time and skills. Despite some initial resistance and conflict from some

non-prescribing nurses, one stated in the short answer survey response they had derived benefit from attending the education sessions and had ‘intensified’ their own assessment practices because of the project. Concern from non-prescribing nurses about DNS prescribing related to the ‘medicalisation’ of nursing, shifting the education focus of DNS consultations to consider prescribing issues, ‘over confidence’ and losing the ‘art of caring’. A number of DNS acknowledged the risk by viewing prescribing as just an ‘add-on’ to their nursing responsibilities: “So you have to be quite conscious not to give away the nursing part of the consultation so that you’re still doing the nursing assessment rather than just looking at the medications” (DNS 4/2i). However, prescribing DNS were increasingly seen by others as a resource for non-prescribing nurses thereby reducing the overall workload of doctors who were interrupted less often.

The interviews with DNS and doctors suggested the formal processes for case review had strengthened collegial relationships, especially at the sites which had opened up the weekly meetings to other practitioners in the service. “The communication between the nurses and the physicians is improved, or ‘enhanced’ perhaps is a better word” (DNS 3/1ii). The doctors also seemed more aware of the breadth and depth of the practice experience the nurses have. Furthermore, the project has initiated more productive use of time in the sense that “the time which was probably won on one side with reducing the simple kind of admin tasks [signing prescriptions] are now replaced with education sessions; which is interesting and actually very beneficial for all sides involved” (Doctor 2/2ii).

### 7.4.2 Impact on service delivery and workload

Participants were clear that DNS prescribing provided a “far more, FAR more efficient” (Doctor 4/1i) service, but importantly, also provided a safer prescribing process: “The patient doesn’t have to get the instruction on what to do and then go to someone else and pick up the prescription. And there’s potential for an error in the overlap” (Doctor 3/1i).

However, more in-depth consultations take time and the length of appointment time was not changed accordingly. Generally 40 minutes is allocated for a new patient and 20 minutes for a follow-up appointment. The point was made that the patients referred to the diabetes centres have complicated diabetes that often the general practitioners have difficulty managing in the community. Experienced physicians often struggle to sort out the complexity in a 20 minute time slot and the nurses really needed more time too: “And I think the nurses have just noticed how, when they have to start looking at the patient’s medications and making those clinical decisions about changing doses, that that runs well past that 20 minutes” (Doctor 4/1i).
Staff shortages compounded the problem and it was felt the project would have been easier if there had been more medical staff for supervision, and more non-prescribing DNS as well: “it would be easier for us if we had not the shortage of staff because it would allow them [the prescribing DNS] to have more time to concentrate on what they’re doing” (Doctor 3/2i).

The work of supervising and mentoring the nurses into a prescribing role was demanding for those physicians whose workloads were already heavy and where short staffing was a problem. There was an assumption that the DNS would come to the project with the necessary basic pharmacology knowledge, however that was not always born out in practice and added to the work of getting the DNS up to speed through intensive tutorials: “throughout the programme I had noticed that there were deficits in the nurse prescribers’ knowledge on a lot of the drugs that they were given permission to prescribe. So we’ve had some intensive tutorials around each of the drugs that they’re authorised to prescribe, with one of them going away and actually studying up one class of drugs in detail, presenting it to the group and then we have a discussion about each class of drugs. And the reason that I clicked on was just because one of the doctors when I was away for a week, had suggested that one of the nurses prescribe a Thiazide medication. When I asked the nurse, ‘Well, tell me the side effects of this? Did you check the electrolytes?’ They really didn’t know much about the drug. And so that was when I cottoned on to the fact that I really needed to give them some quite intensive tutorials. I mean because I had presumed that that level of knowledge was going to be there before they started to prescribe” (Doctor 4/1i).

The impact on service delivery and workload needs to be considered with respect to the ongoing supervision requirements of existing DNS prescribers and of any new prescribers. While the ongoing supervision requirements of DNS prescribing is unlikely to be more onerous than it was under standing orders prior to the project, if the project rolls out to other areas there are resource implications that have yet to be properly addressed: “But I guess the issue is going to be there are a lot of nurse specialists at the diabetes centre, and a lot of them are going to want to go through the prescribing programme and so the question is for me, who’s going to supervise them because I certainly don’t think I could supervise three again. It’s just too much work. I mean I could certainly supervise one again” (Doctor 4/1ii).

7.4.3 Educational preparation
The level of educational preparation of DNS varied between sites, as did views about its adequacy. The project participants were confident about DNS readiness to prescribe in sites where most nurses had completed or almost completed Masters degrees: “I think what’s really good about the nurses here is that they’re all educated to a Masters degree level, which means that they’ve in a
structured, in a syllabised way been taught and thought about issues around prescribing and the patho-physiology of diabetes and so on … and so within the department I think the nursing cohort is more than adequately qualified” (Doctor 2/1i). These nurses too considered their level of academic preparation and extent of clinical experience to be essential for safe prescribing, suggesting it would have been challenging for any one without both: “I don’t believe that people who have years of clinical experience can walk into something like this. I think they still need the post graduate preparation to be able to do this” (DNS 2/4i). A response from the team member survey was specific about the minimum level of education necessary to support safe prescribing practice: “They should be qualified to the correct level to ensure advanced practice and patient safety. Should at least have post grad diploma [and] have done pharmacology paper” (Team survey response).

In addition to a postgraduate certificate or equivalent to be authorised to prescribe, the Nursing Council requirements are for a six – 12 week supervised practicum. There were some reservations expressed about the practicum experience provided in the period immediately prior to the start of the project and the limited time spent working with a prescriber: “We spent some time working with a prescriber to kind of prove I guess that we were competent. Perhaps that working with the prescriber could have been a little bit longer” (DNS 2/4ii). One team member who replied ‘maybe’ in the survey to concerns about DNS prescribing, was not aware a practicum had taken place but stressed its necessity: “I also feel a short practicum of some description would be beneficial especially prior to prescribing agents such as anti-hypertensives which the nurses may not know as well as the anti-diabetic agents” (Team member survey).

A key task in the first months of the project was improving the nurses’ knowledge in the less familiar antihypertensive and lipid-lowering medicines. To a certain extent this was expected, but suggestions were made that future processes be more formal and robust: “[I have] a question about a formalised structured, training program which could for the future be part of the process where it is stipulated, a kind of curriculum based training with an assessment tool for the other medications which are new to the nurses” (Doctor 3/1i). Despite the nurses being assessed as competent at the end of the practicum, another doctor was emphatic that an additional formal assessment was necessary, ideally an exam, for which the DNS would need to prepare before they began prescribing: “So that is one major factor that needs to be addressed before a nurse is allowed to prescribe. I mean the nurses have done their pharmacology papers, whatever, at some time in the past but they need to have a formal assessment and exam before they actually start, right before they start this programme, you know, not relying on something they’ve done 5 years ago” (Doctor 4/1ii).
The standard of education and experience required to participate in this project was considered by many to be the minimum. Any possibility of a lower standard in the future was viewed with concern: “I think my concern would be that the level of specialism and the level of education that has been necessary in order to qualify for this project are maintained” (Doctor 2/1i).

### 7.4.4 DNS satisfaction with extended role

Aside from one or two comments suggesting the increased responsibility associated with prescribing should be acknowledged with appropriate remuneration, all project participants agreed that DNS prescribing should continue. There was a high level of personal satisfaction with the extended role and the ability to get the job done without impediment: “It just completes the process that you’ve done with somebody. You know you’ve done all the education, started someone on insulin, got it all sorted, handed them the script, they’re going to start insulin tonight. And they just walk out and they’ve got everything they need. We don’t have to be fiddling and twiddling with doctors or trying to track doctors down. You know it’s much more satisfying for us that you feel that you can just get on with the job and you’re not annoying people all the time trying to do your job” (DNS 2/3ii).

There was also a high level of agreement that patient assessment skills and prescribing decisions were more holistic, which led to more effective care. These factors too were highly satisfying. “perhaps before, we focussed on glycaemic control more than we do now; we’re now looking more holistically. Although having said that I think we did that before but this prescribing project made me become more focussed on blood pressure control and lipid profile and not being as accepting of ‘Oh well, that’s okay’. We’re really wanting to move things forward and make changes, and that has made us more effective” (DNS 2/4ii).

### 7.4.5 Patient access to services

Improved access to diabetes services was a specific objective of the DNS prescribing project, but physicians and DNS when asked at interview provided a variety of replies based around how each defines ‘access’. The access or referral criteria to diabetes services has not changed, so if one defines access on that basis then there is no improvement to access for patients.

However, a number of project participants shifted the question to be about access to medicines. A physician explained that if a patient can receive a prescription directly from the DNS, it removes a barrier to their access to medicines: “but every extra step is a potential barrier and particularly when you’re talking about an ambivalent patient. You know ones who really don’t want to start insulin but sort of acknowledged they probably should do, any extra step is a deterrent (Doctor 3/1ii).
For the sites that accept self referral the perception of improved access to medicines was clear. One nurse gave the following example: “we’ve got the odd person who might walk in who’s in the area for seasonal work, doesn’t have a primary care provider in the area, needs a prescription for medicines and knows that they can come to a diabetes centre. So I think that has enabled people to have better access to care that they may not necessarily, it might have been more problematic for them otherwise” (DNS 3/2ii).

Another example of improved access is for people with little money: “particularly young people or people with no money or socially challenged or whatever, we can just give them a script on the spot and because you know they haven’t got money, they’re not going to go to the GP, they’re going to run out of whatever and so that’s been a huge, you know, specific to the community I guess” (DNS 3/3ii).

7.4.6 Determination of merit

Overall, the evaluation findings are that the wider diabetes team members are supportive of DNS prescribing and team relationships in the diabetes centres have grown in collegiality. DNS are very satisfied with their extended role and responsibility and a positive impact on workload is anticipated because the prescription process is clearly more efficient. There are some reservations about the workload implications related to providing supervision and about how well prepared some of the nurses were to begin prescribing.

**Outcome standards:**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Views of the wider diabetes team members are: Fully supportive of DNS prescribing; Believe educational preparation to be excellent; That there are positive impacts on the service and workloads; That the team environment is excellent and patients have improved access. DNS are highly satisfied with extended role.</td>
</tr>
<tr>
<td>Good</td>
<td>Views of the wider diabetes team members are: Supportive of DNS prescribing; Believe educational preparation to be good; That there are positive impacts on the service and workloads; That the team environment is good and patients have improved access. DNS are satisfied with extended role.</td>
</tr>
<tr>
<td>Acceptable</td>
<td>Views of the wider diabetes team members are: Generally supportive of DNS prescribing; Believe educational preparation to be acceptable; That there are some positive impacts on the service and workloads; That the team environment is unchanged and that patients have at least the same access. DNS accept extended role.</td>
</tr>
<tr>
<td>Poor</td>
<td>Views of the wider diabetes team members are: Not supportive of DNS prescribing; Believe educational preparation to be inadequate; That there is little impact on the service and workloads; That the team environment is poor and patients have poor access. DNS are dissatisfied with extended role.</td>
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8 Discussion and implications for national roll-out

The findings from this evaluation of the DNS prescribing project are that DNS prescribing is safe, of high quality and appropriate. DNS prescribing brings important benefits to the effectiveness of specialist diabetes services, is acceptable to patients, and is supported by the wider health care team. These findings are generally consistent with the findings reported in the international literature about non-medical prescribing in a range of different practice areas.\textsuperscript{15}

8.1 Lessons learnt

A lesson learned from this project is that thorough planning and coordination are essential for a project to be successful. In this case there were significant challenges to critical inputs to the project. These challenges were largely overcome because of exemplary project management skills which compensated for the externally imposed delays.

The apparent ease of project implementation at a practice level also indicates thorough planning and coordination. Without the clinical credibility of the Project Manager, and her long established relationships with the clinician participants, project implementation may not have been so successful. The lesson learned is that project management experience alone is not sufficient for success in a clinically-driven environment.

The recent diabetes workforce service review\textsuperscript{16} identifies the need for adequate information technology (IT) systems that interface between primary care providers and specialist services. The quality and safety of DNS prescribing has been established in this evaluation through the manual collection of clinical data and hard copy review of patient records. Ongoing quality and safety monitoring of prescribing would be better served if these data were available electronically.


8.2 Should the project be generalised and spread?

There are only a few issues to highlight if DNS prescribing is to be rolled out to other specialist diabetes centres, or perhaps to other areas of nursing, and these fall broadly into three interconnected categories: education, regulation and resourcing.

8.2.1 Education for RN prescribing

The Nursing Council requirements for education and training determined for this project are for two level eight papers or equivalent that includes pathophysiology, clinical assessment and decision making, and pharmacology content, as well as the completion of a six to 12 week practicum with an authorised prescriber. Tertiary education providers currently offer this content to registered nurses in a programme of four level eight papers comprising a postgraduate diploma. There is support in the data that a postgraduate diploma qualification would be a more appropriate requirement.

The practicum experience for the DNS participating in this project was designed and implemented within a short timeframe. A lesson learnt from the project is the importance of adequate preparation for nurses before they commence a prescribing role. A full six to 12 week practicum experience would better prepare nurses to prescribe, particularly where less familiar classes of medicine are involved.

We suggest if the project is to be generalised and spread, a consistent standard of practicum experience and assessment be required that is part of an approved Nursing Council programme and alongside an authorised prescriber.

8.2.2 Regulation of RN prescribing

There are currently three scopes of practise for nurses in New Zealand: enrolled nurse, registered nurse and nurse practitioner. Each scope has a set of competencies determined by the Nursing Council. The registered nurse competencies are the minimum level for entry to the nursing profession, whereas the nurse practitioner competencies are the minimum level for entry to advanced nursing practice, and include competencies for prescribing. At present there are no competencies for registered nurses who prescribe. These nurses clearly do and should practice at a more advanced level than entry level, yet do not practise, or are not required to practise, at nurse practitioner level.
If the project is to be generalised and spread, we suggest the Nursing Council develop competencies for registered nurses who prescribe. The practicum experience could then be matched to those competencies and not the nurse practitioner competencies as is currently the case in most universities.

8.2.3 Resourcing for RN prescribing
The DNS prescribing project requirements were for close supervision and monitoring of prescribing over a six month period. These requirements were over and above the requirements normally expected of a supervisor/supervisee relationship. Assuming the project is to be generalised and spread, the period of close supervision would take place during the practicum, and before the nurse were authorised to prescribe. Ongoing supervision is a requirement in the regulations, although what that entails is not defined and is likely to evolve over time.

The commitment of time required of authorised prescribers to supervise nurses’ prescribing – be it in a project such as this or in a practicum – has workload and resource implications. For the DNS prescribing innovation to be sustainable, we suggest that Health Workforce New Zealand consider the implications of providing appropriate and sufficient practicum supervision for nurses who want to prescribe. A limiting factor for roll out to other areas lies in the availability of authorised prescribers who are willing and able to take on this role and responsibility of supervision on an ongoing basis.
9 Report annexes

9.1 Project documents

9.1.1 Excerpt from the NZSSD Project Plan
9.1.2 Key facts
9.1.3 Q & A – Diabetes nurse prescribing demonstration sites
9.1.4 Q & A for people with diabetes about the diabetes nurse prescribing demonstration
9.1.5 Practicum assessment form
9.1.6 Clinical data record
9.1.7 Prescribing log
9.1.8 Project supervision document
9.1.9 Clinical audit
9.1.10 Quality of prescriptions audit

9.2 Evaluation documents

9.2.1 GP survey
9.2.2 Team Survey
9.2.3 Patient survey
9.2.4 Interview schedules
9.2.5 Ethics approval & related documents
## 9.1 Project documents
### 9.1.1 Excerpt from the NZSSD Project Plan

A summary of key tasks and activities is presented below. Note requirements as specified within the project reporting requirements of the project are not repeated in detail below. Unless otherwise specified, the project manager is responsible for ensuring completion of these tasks.

<table>
<thead>
<tr>
<th>Task</th>
<th>Activities</th>
<th>Timeframe</th>
</tr>
</thead>
</table>
| 1. Project Set up | • Confirm project plan  
• Develop communication plan  
• Commence any detailed planning within each task  
• Set up meetings/forums to progress work  
• Develop terms of reference for the reference group  
• Ensure Nursing Council requirements have been confirmed for DNS prescribers  
• Ensure prescription medicines and devices list has been confirmed | 30 October 2010 |
| 2. Request for proposals – Demonstration Sites | • Develop service agreement template for demonstration sites  
• Develop RFI document including advertisement, outline of requirements, evaluation & appointment process for RFP  
• Appoint evaluation panel for RFI  
• Test RFI criteria and contents prior to issue HWNZ and the reference group  
• Advertise on NZSSD, HWNZ & Nursing Council and professional body websites  
• Evaluate  
• Negotiate with preferred providers and appoint sites  
• Announce appointments | ROI issued November 2010  
ROI evaluation completed 10 December 2010  
Negotiation with successful applicants completed 21 December 2010  
Appointments announced end December 2010 date |
| 3. Develop “Guide to prescribing Medications” specific to demonstrates sites | • Write draft, test with reference group  
• Revise & finalise  
• Print ready for distribution  
• Publish on internet (NZSSD, HWNZ or HIIRC) | 30 October 2010 |
| 4. Develop protocols & associated supporting documents for the supervision and review of DNS prescribing | • Identify clinical champion in each demonstration site  
• Link/update communications plan to demonstration site activities  
• Write protocols that describe the designated prescriber model including clinical reasoning flowcharts, process | 20 January 2011 |

Note that all activities will have associated communications
<table>
<thead>
<tr>
<th>Task</th>
<th>Activities</th>
<th>Timeframe</th>
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</table>
| 4.  | for supervision & review  
- Develop supporting documents & method to consistently collect information  
- Test with stakeholders  
- Test against evaluation criteria  
- Revise & finalise  
- Work with demonstration sites to revise their implementation plans for the project (as submitted in the RFP process)  
- Develop patient fact sheet & test with reference group & diabetes society |  |
| 5.  | Work with demonstration sites to develop processes to support DNS prescribing role  
- Review current policies and processes within demonstration sites to amend to ensure patients can be re-directed to the DNS at point of referral to support project outcomes | 30 January 2011 |
| 6.  | Develop data collection requirements & supporting documents  
- Develop documents and associated protocols or processes for the collection of data (baseline and implementation project) to support the evaluation taking into consideration any existing systems that may be able to be utilised (e.g. incident & accident monitoring, internal audits, existing patient surveys that could be amended etc)  
- Test with reference group  
- Test with evaluator | January 2011 |
| 7.  | Develop reporting requirements for demonstration sites  
- Write reporting requirements document including roles & responsibilities for communication, feedback & progress reporting  
- Develop reporting template & schedule for reporting monthly | 1 December 2010 |
| 8.  | Establish on-site monitoring processes  
- Set up four weekly site visits by project manager with sites where material is reviewed for completeness & opportunities for enhancement can be discussed face to face | February 2010 |
| 9.  | DNS prescriber networking  
- Set up teleconferences for regular communication between DNSs and supervising diabetes physicians within sites (i.e. fortnightly then monthly once sites are established) & sharing of information/tools  
- Micro site HIIRC[^18]  
- Approve all tools, templates, guidelines and protocols for the project & provide | 30 January 2011 |

[^18]: A microsite would allow a closed website within the HIIRC that allows for discussion forums which may be beneficial to the demonstration sites. It also allows for easy uploading of information as resources.
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<tr>
<th>Task</th>
<th>Activities</th>
<th>Timeframe</th>
</tr>
</thead>
</table>
| 10. Process for clinical audit developed | • Ensure medical diabetes specialist has been identified to undertake clinical audit (and that this is detailed in demonstration site implementation plans)  
• Develop process for monitoring files for clinical audit  
• Develop requirements for clinical audit  
• Develop clinical audit reporting template  
• Test with reference group  
• Test with evaluator | 30 December 2010 |
| 11. Appoint independent evaluator | • Develop Request for Quote document (& gain approval from HWNZ before advertising)  
• Appoint evaluation panel  
• Call for Request for Quotes  
• Evaluate Request for Quotes  
• Gain approval from HWNZ to appoint  
• Appointment process (negotiation, contract award) | 30 October 2010  
12 November 2010 |
| 12. Develop evaluation plan | • Ensure independent evaluator develops evaluation plan consistent with requirements of the innovation project  
• Test with reference group  
• Obtain approval from HWNZ of the plan | 30 November 2010 |
| 13. Project reporting | • Complete project reporting monthly to HWNZ as per template supplied  
• Attend project steering group meetings | 30th of each month |
| 14. Communications | • As per communications plan | Refer communications plan |

**Deliverables**

- Project Plan (this document)  
- Communication Plan  
- Monthly reporting to project sponsors  
- Phone/email reporting of any emergent issues  
- Baseline data  
- Implementation data  
- Evaluation report  
- Guidance documents, protocols, tools to support implementation
9.1.2 Key facts

The following key facts will support the delivery of key messages:

- Nurses frequently take on extended roles, particularly in the management of chronic disease and long term conditions, providing them with greater career opportunities and freeing up doctors to concentrate on diagnosis and management of more complex cases and disease complications.
- Diabetes nurse specialists already take responsibility for autonomously managing the care of many diabetes patients, and taking on responsibility for prescribing common diabetes medications is a natural extension of that role.
- The ability of the DNS to prescribe will ensure greater continuity of care and convenience for diabetes patients who would no longer have to have a second appointment with a medical practitioner specifically for a prescription.
- Nurses frequently have more time to spend with patients which can ensure that any problems are identified early, leading to better management of the condition.
- Nurse prescribing from a defined formulary is well established internationally. Prescribers are experienced nurses who undertake thorough training and are nationally regulated to ensure the safety of patients.
- The DNS works as part of a multidisciplinary team ensuring that professional support and advice is available.
- The development of DNS prescribing will be carefully trialled and evaluated in a small number of demonstration sites that will measure the effectiveness and thoroughly assess all safety and quality issues.
- The pilots will be conducted in partnership with NZSSD and will ensure ongoing involvement of nursing, medical and patient representative bodies.

Workforce innovations such as DNS prescribing ensure that we continue to make the best use of the potential of the NZ health workforce and achieve better value for patients.
9.1.3 Q & A – Diabetes nurse prescribing demonstration sites
31 March 2011

1. Why are diabetes nurse prescribing demonstration sites being set up?
Demonstration sites are being set up to show that diabetes nurse prescribing is safe and
effective. The demonstrations will be evaluated to help to determine any changes that may
be required before rollout to other parts of the country or other services.

2. Who are the nurses who will be involved in the demonstration sites?
They are registered nurse practising in diabetes health who meets specified requirements,
as set by the Nursing Council of New Zealand, for competency, qualifications and training to
prescribe certain prescription medicines and devices for the management of diabetes and its
related conditions.

3. How many nurses will there be at each demonstration site?
Between two and four. Each nurse who has met the specified requirements will be
authorised by the Nursing Council of New Zealand to prescribe a limited range of
medications and devices relevant to diabetes care.

4. Where are the demonstration sites?
Four demonstration sites have been confirmed in Hawke’s Bay, Mid Central Health,
Auckland and Hutt Valley DHB, which will begin in April 2011.

People with diabetes in these four North Island regions will have their medication managed
by registered nurses practising in diabetes health in a project that aims to make life easier
for patients and make better use of nursing skills. The nurses in each of the demonstration
sites will prescribe a limited range of medicines to their patients, under the guidance of a
medical practitioner. The project will be fully evaluated before rollout to other parts of the
country or other services.

5. How were the demonstration sites selected?
A request for Registrations of Interest (ROI) was sent out to all diabetes specialist services in
New Zealand via the New Zealand Society for the Study of Diabetes email distribution list
(>250 names in all DHBs) and was posted on their website. Eight (ROIs) were received. A
panel assessed the applications against set criteria and four sites were selected.

6. Were there any regional considerations?
Yes, the panel considered the benefits of a mix of rural, provincial and bigger city services to
ensure a range of experiences within the demonstration project.

7. How many people with diabetes will benefit from this project at each site?
Each month about 40 people with diabetes will see one of these nurses. People will access
this care when they are referred by their general practice team or hospital specialist for
assessment, treatment and advice to the demonstration site.
8. **Will there be any additional charges for prescriptions?**
   No. The costs to people with diabetes will be no different than if the medication was prescribed by a medical practitioner.

9. **How will the success of the demonstrations be measured?**
   An independent evaluation will be undertaken of the demonstrations. Success will be measured in a number of ways for example: patient safety, patient satisfaction, clinical outcomes and team satisfaction.

10. **Is this demonstration about greater efficiency for current services or about making diabetes services accessible to more people?**
    The primary aim is to show that, as in the United Kingdom, diabetes nurse prescribing is safe and effective. Secondary aims are to demonstrate enhanced access to timely and appropriate treatment, and improved efficiencies and satisfaction for both people with diabetes and diabetes health care teams.

11. **What will happen next?**
    The demonstrations will run for a period of six months and the evaluation will be completed 2 months later.

    The findings of the evaluation will help to determine any changes that may be required before rollout to other parts of the country or other services.
1. Why are diabetes nurse prescribing demonstration sites being set up?
Demonstration sites are being set up to show that diabetes nurse prescribing is safe and effective. The demonstrations will be evaluated to help to determine any changes that may be required before rollout to other parts of the country or other services.

2. Who are the nurses who will be involved in the demonstration sites?
They are registered nurse practising in diabetes health who meets specified requirements, as set by the Nursing Council of New Zealand, for competency, qualifications and training to prescribe certain prescription medicines and devices for the management of diabetes and its related conditions.

3. How will this affect people with diabetes?
It makes sense that the nursing expert who helps people with diabetes to manage their condition/s, and who knows them and their circumstances, can also prescribe medication. This may save time and the need for additional appointments with a GP or diabetes specialist.

4. Will there be any additional charges for prescriptions?
No. The costs to people with diabetes will be no different than if the medication was prescribed by a medical practitioner.

5. Is it safe to have a registered nurse practising in diabetes health prescribing medication?
Registered nurses practising in diabetes health who are designated prescribers are very experienced and will know a lot about their patients, and their specific circumstances. They have received specialist training and work as a team with other medical specialists to ensure patients are receiving the best possible care.

6. Will people with diabetes still need to see their doctor sometimes?
Yes. The relationship between a person with diabetes and their GP will remain the same, and they may need to see their GP or specialist if there are significant changes in their diabetes. Often a registered nurse practising in diabetes health will be the best person to monitor the condition, help patients manage it and provide routine prescriptions. These nurses will be able to prescribe only those medications related to diabetes and its related conditions.

7. Will this change how people with diabetes manage their diabetes? Do they need to do anything different?
The management of diabetes will remain the same, although if a person with diabetes requires medication, they may no longer need to make a separate appointment to see the
doctor. The registered nurse practising in diabetes health will be able to prescribe diabetes and related medications and provide excellent ongoing care.

8. **How will people with diabetes access care from these nurses?**
People will access this care when they are referred by their general practice team or hospital specialist for assessment, treatment and advice to one of the demonstration site.
9.1.5 Practicum assessment form

Diabetes Nurse Specialist prescribing demonstration project

Prescribing practice assessment record to be completed at end of practicum\(^\text{19}\)

Please rate the diabetes nurse specialist using the key with a score from 1-5. Please comment in space provided at the bottom of the table, especially if any aspect of the nurse’s prescribing practice scores 1 or 2.

<table>
<thead>
<tr>
<th>Clinical Knowledge and Skills</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribing practice substantially below expected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescribing practice requires further development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescribing practice meets expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescribing practice better than expected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescribing practice exceptional</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Clinical knowledge** (knowledge of common symptoms, drug doses and side effects, drug interactions, etc)
- **Professional knowledge** (knowledge of guidelines, policies, medico legal aspects)
- **Clinical documentation** (adequacy of detail in written records, legibility, accurate prescribing)
- **History taking** (ability to take comprehensive history)

\(^{19}\) This assessment record was adapted from the Medical Council of New Zealand’s Supervision report template (2007).
<table>
<thead>
<tr>
<th><strong>Clinical Judgement</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic skills</strong></td>
<td>(identifies and</td>
<td>prioritises patient</td>
<td>problems)</td>
</tr>
<tr>
<td><strong>Patient management</strong></td>
<td>(synthesises data,</td>
<td>makes appropriate</td>
<td>management</td>
</tr>
<tr>
<td><strong>Recognising limits</strong></td>
<td>(accurate assessment</td>
<td>of own skills, refers</td>
<td>and consults with others as required, takes responsibility for actions)</td>
</tr>
<tr>
<td><strong>Cost effective prescribing</strong></td>
<td>(prescribing is appropriate and considers cost implications)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Physician comments:** Describe strengths, areas for improvement

Physician’s name (please print): ____________________________ Reg #: __________
Physician’s signature: ____________________________ Date: __________

Diabetes Nurse Specialist prescriber

My signature indicates this assessment has been discussed with me. I would like to make the following comments:

Name (please print): ____________________________ Reg #: __________
Signature: ____________________________ Date: __________
## 9.1.6 Clinical data record

**Nurse’s name:** 

**Name, address, DOB, sex and NHI:**

(Attach patient label if available)

### DIABETES CLINICAL DATA RECORD

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>New Zealand European</th>
<th>Niuean</th>
<th>Other, please state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maori</td>
<td>Chinese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoan</td>
<td>Indian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook Island Maori</td>
<td>Tongan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of diabetes</th>
<th>Type 1</th>
<th>Type 2</th>
<th>GDM</th>
<th>Pregnancy</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other medical conditions</th>
<th>Hypertension</th>
<th>Diabetic renal disease</th>
<th>Foot problems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dyslipidaemia</td>
<td>Diabetic eye disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cerebrovascular disease</td>
<td>Asthma/COPD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ischaemic heart disease</td>
<td>Obesity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoking status</th>
<th>Current</th>
<th>Past</th>
<th>Never</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Current medications (Generic medication name only, no dose required).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Weight (kg)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Blood pressure (mmHg)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HbA1c (mmol/mol)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>ACR (mg/mmol)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Creatinine (μmol/l)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>eGFR/GFR (mls/min)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total Cholesterol (mmol/l)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HDL (mmol/l)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>LDL (mmol/l)</th>
</tr>
</thead>
</table>
## 9.1.7 Prescribing log

### NURSE PRESCRIBING LOG

**Name, address, DOB and NHI:**
(Attach patient label if available)

<table>
<thead>
<tr>
<th>Date of referral:</th>
<th>○ New patient ○ Repeat</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of visit/contact:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1. Prescribing outcome:**

*Note: Complete boxes 2 & 4.*

- ○ Prescription given for new medication
- ○ Existing prescription unchanged
- ○ Existing prescription revised (e.g. dose altered or stopped)
- ○ No, or incomplete, prescription given

**State name of drug prescribed or changed but no doses needed. Indicate ↑ for dose increase & ↓ for dose decrease**

- ○ hyperglycaemia
- ○ hyperglycaemia
- ○ hypoglycaemia
- ○ smoking cessation
- ○ other

**2. If a prescription was revised or new prescription given, what was prescribed and for what condition?**

*Note: Name of drug but no dose required*  

- ○ hyperglycaemia
- ○ hyperglycaemia
- ○ hypoglycaemia
- ○ smoking cessation
- ○ other

- ○ CVD risk
- ○ renal protection
- ○ hypertension
- ○ hypertension

**3. How was the prescribing decision made?**

- ○ Independently
- ○ Following consultation with a prescriber
- ○ Dual consultation with a prescriber

**4. If no prescription was provided, why not?**

- ○ None required
- ○ The prescription required was not listed for diabetes nurse prescribing (specify)
- ○ Other reason (please specify)

**5. Other action:**

- ○ Advice given
- ○ Follow-up appointment made
- ○ Referral to other service made (specify who referral made to)
- ○ Tests ordered

**6. Time spent with patient**

- Minutes direct pt contact:
- Documentation/admin minutes (not project related):

**7. Type of contact**

- ○ clinic visit ○ telephone ○ home visit ○ email ○ fax

**8. If a repeat visit, has the patient had a hospital admission since last visit due to their diabetes?**

- ○ Yes Specify reason
- ○ No

**9. Adherence assessment**

*Note: Please tick only one.*

- Exercise ○ poor ○ satisfactory ○ excellent
- Medication ○ poor ○ satisfactory ○ excellent
- Diet ○ poor ○ satisfactory ○ excellent

**10. Name any other clinician (by discipline) seen during this visit:**

**11. If a script was received from GP or hospital since last contact, please write on back of sheet the number and frequency of patient’s visits to other clinicians for scripts (by clinician):**
Diabetes Nurse specialist prescribing demonstration project

Guideline: Prescribing practice supervision\(^\text{20}\)

1. Background

The New Zealand Society for the Study of Diabetes (NZSSD) has been commissioned by Health Workforce New Zealand in partnership with the Nursing Innovations Team of the Ministry of Health to establish at least three demonstration sites to test the effectiveness and safety of Diabetes Nurse Specialist (DNS) prescribing.

Within the demonstration project participating Diabetes Nurse Specialists (DNS) are able to prescribe a limited number of prescription medicines that are used for people with diabetes under the supervision of a diabetes specialist physician. The project will be monitored by both the demonstration sites and NZSSD and will be subject to an independent evaluation.

2. Purpose of this guideline

This guideline has been developed to assist participating diabetes nurse specialists, diabetes specialist physicians and employers to understand and apply supervision of the nurse’s prescribing practice as required within the demonstration project.

3. What Constitutes Supervision?

Supervision can be both formal and informal:

*Formal supervision* is regular protected time, specifically scheduled and kept free from interruptions, to enable facilitated in-depth reflection on clinical practice.

*Informal supervision* is the day to day communication and conversation providing advice, guidance or support as and when necessary.

---

\(^{20}\) NZSSD, February 2011

This guideline was adapted from the Medical Council of New Zealand’s Induction and Supervision for Newly Registered Doctors guide (2007).
Supervision is flexible:
Supervision is time limited and is flexible depending on the DNS’s requirements. Closer supervision is usually required in the beginning and decreases over time once the DNS and diabetes specialist physician become confident with clinical reasoning and prescribing decisions.

3.1 Timing of meetings

- The supervising physician is expected to meet with the prescribing DNSs weekly
- The frequency of weekly meetings can be amended if deemed appropriate by the diabetes specialist physician. The project manager should be notified of any amendments

3.2 Purpose of regular meetings

The purpose of the regular meetings is to:
- review of prescribing activities (all new prescriptions and dose titrations made in that week for the first 2 weeks, then all new prescriptions and a selection of titrations in following weeks). This will require review of clinical notes, lab results and copies of scripts written.
- review and give feedback on prescribing practice
- enhance knowledge and clinical practice skills
- discuss difficult or unusual cases
- discuss general related topics as they arise

4. Components of prescribing practice supervision

4.1 Prescribing

Explain pharmaceutical schedule and prescribing:
- Minimal requirements for legally acceptable prescribing
- Appropriate use of pharmaceuticals in diabetes care
- Monitoring processes for effectiveness, safety and cost

4.2 Patient safety

Detail patient safety issues:
- Define limits of prescribing responsibility and lines of accountability
- Backup arrangements when the supervising physician is unavailable

4.3 Legislative requirements

Ensure there is appropriate information available so that DNSs understand the legislative requirements relevant to the following, as they relate to prescribing within the registered nurse’s scope of practice in New Zealand (refer to Appendix A for a synopsis on each Act):

- Health Practitioners Competence Assurance Act 2003
4.4 Scholarship

Outline the practice review activities and available publications that form part of scholarship:
- Peer review
- Continuing nursing education
- Clinical audits
- Critical incident debrief
- Participation in case review, grand rounds etc:
- Relevant clinical journals

4.5 Professionalism

Outline these personal aspects of professionalism:
- Therapeutic boundaries
- Mentoring
- Limits of clinical responsibility pertaining to scope of practice as a registered nurse
- Patient expectations and controlling burden of care

5. Responsibilities of Diabetes Nurse Specialists Working under Supervision

5.1 Set-up and management

Your responsibilities regarding set-up and management are to:
- make a commitment to take part fully in the supervision process
- take responsibility for setting up an appointment schedule with the diabetes specialist physician and diary the appointments
- work with the diabetes specialist physician to set supervision and educational objectives as necessary
- keep a prescribing/ clinical logbook
- keep a record of your participation in continuing professional development activities in your log book

5.2 During supervision

Your responsibilities during supervision are:
- to communicate clearly with the diabetes specialist physician. If you need specific supervision or experience, discuss this with diabetes specialist physician
- if you are calling your diabetes specialist physicians, to preface your conversation with a clear indicator of why you are ringing, for example:
  o for approval of a management plan
  o for advice, or
  o for active assistance
- to be prepared to accept constructive comments and be receptive to change and develop your prescribing practice if required
- to take part in audit and peer review
- to ask for advice
- if you need more support, to consider asking for mentoring to be arranged.
5.3 Problems

Your responsibilities regarding problems are:

- to contact your diabetes specialist physician early if you have a problem

6. Responsibilities of supervising diabetes specialist physicians

6.1 Supervisors are not civilly liable

Nursing practice is regulated by the HPCA Act through the Nursing Council of New Zealand. Diabetes specialist physicians are not civilly liable for the actions of the diabetes nurse specialists they are supervising unless they act in bad faith or without reasonable care.

6.2 Requirements and responsibilities of a supervisor:

- demonstrate a positive attitude in relation to nurse prescribing and the role of nurse prescribers within the multidisciplinary team
- possess a keen desire to work with and supervise nurse prescribers
- possess a commitment to be available on a day to day basis for clinical consultation
- be clear about the lines of communication
- make sure that protected supervision time is scheduled regularly and kept free from interruptions to both the diabetes specialist physician and the nurse/s being supervised
- be readily available and approachable
- make sure that alternative arrangements are made for ongoing supervision if you cannot fulfill the supervisory obligations for any reason
- provide clear clinical notes and comprehensive management plans, which include parameters clarifying when specialist involvement is required for a particular patient
- monitor and verify appropriateness of the diabetes nurse specialist’s prescribing of diabetes medicines and products
- maintain weekly review meetings until you are sure reducing the frequency will not put patients at risk

6.3 General review at commencement of project

Arrange for review of the diabetes nurse specialist’s understanding and knowledge of key clinical areas such as:

- referral guidelines
- prescribing guidelines
- relevant investigations
- screening and treatment protocols
- medico-legal awareness
- communication and patient satisfaction
- understanding of the Accident Compensation Corporation (ACC), HealthPAC, PHARMAC and other agencies, and other issues relevant to the nurse’s prescribing practice
- compete the prescribing practice assessment record (Appendix B) at three months after commencement of the project and at completion of the project. Assessments are to be made available to the project manager.
INSTRUCTIONS:
Complete a separate audit form for each patient file (10 patients in total per nurse) as selected for the audit by Claire.
1. Fill in demonstration site name.
2. Fill in name of nurse being audited.
3. Enter the NHI number in box provided.
4. Review each patient's notes and consider each of the questions in turn.
5. Please indicate Yes, No or Not Applicable (NA) in the appropriate row, and where requested, explain further in the Comments box.

EXPLANATION OF TERMS USED:
APPROPRIATE PRESCRIPTION: were the medications prescribed for an appropriate indication, and relevant contraindications, drug interactions, comorbidities and/or allergies taken into account?

LAB TESTS: for example, on starting a patient on an ACEI, was conscious consideration given to a check of the serum creatinine and potassium shortly after? On uptitrating an ACEI in a patient also on spironolactone, was the serum potassium checked after?

CLINICALLY SIGNIFICANT MEDICATION DRUG INTERACTIONS OR ADVERSE CONSEQUENCE: was there a clinically significant medication interaction or adverse consequence for the patient that followed directly from a decision by the nurse prescriber to prescribe a medication inappropriately? For example, uptitration of an ACEI dose in a patient with a raised serum potassium; prescription of an ACEI to a patient with known renal artery stenosis, precipitating acute renal impairment; prescription of a statin to a patient being treated with a macrolide antibiotic.

APPROPRIATE ACTION: where a patient experienced a clinically significant medication interactions (e.g. increase in serum creatinine following commencement on therapy with an ACEI), was appropriate action taken (e.g. patient contacted to stop taking that medication, or advised to attend GP or A&E, or follow-up blood tests ordered etc.)?

CONSULTATIONS FOR UNEXPECTED OUTCOMES: for example, in a patient with hypertension refractory to therapy within the scope of this project, was appropriate advice sought?

ADVERSE EVENT LEADING TO HOSPITAL PRESENTATION/ADMISSION: Hospital presentation/admission as a direct result of a nurse prescribing decision
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Don’t know</th>
<th>Missing data</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were the medications prescribed appropriately overall?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>- Was the indication/s for the prescribed medication/s appropriate?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>- Was the dose/s of the prescribed medication/s appropriate?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>Were decisions not to prescribe medications appropriate?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>Were lab tests ordered appropriately, if required?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>Did any clinically significant medication interactions or adverse consequences occur as a result of the nurse’s prescribing?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>In the event of any clinically significant medication interactions occurring, was appropriate action taken?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>In the event of an unexpected outcome, was an appropriate consultation requested?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
<tr>
<td>Were there any adverse events as relating to nurse prescribing that led to a hospital presentation or admission?</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>Don’t know</td>
<td>Missing data</td>
<td>Comments</td>
</tr>
</tbody>
</table>
### 9.1.10 Quality of prescriptions audit

**Quality of prescriptions**: Please complete for 20 scripts per nurse written over the month of August 2011

<table>
<thead>
<tr>
<th>QUALITY OF THE SCRIPTS:</th>
<th>Please circle one option</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>The regulations define a good quality script as manifesting the following characteristics. Please identify if the prescriptions written by the nurses complied with these characteristics by circling yes or no:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is legibly and indelibly printed</td>
<td>Yes (229)</td>
<td>No (0)</td>
</tr>
<tr>
<td>It is signed personally by the prescriber with his/her usual signature</td>
<td>Yes (228)</td>
<td>No (1)</td>
</tr>
<tr>
<td>It is dated</td>
<td>Yes (226)</td>
<td>No (3)</td>
</tr>
<tr>
<td>It sets out the name and registration number of the prescriber</td>
<td>Yes (228)</td>
<td>No (1)</td>
</tr>
<tr>
<td>It sets out the surname, initial of each given name and address of the person for whom the prescription is intended</td>
<td>Yes (229)</td>
<td>No (0)</td>
</tr>
<tr>
<td>It indicates by name the medicine (and where appropriate, the strength), dose and frequency that is to be administered</td>
<td>Yes (226)</td>
<td>No (3)</td>
</tr>
<tr>
<td>It indicates the total amount of the medicine that may be dispensed on the one occasion or on each of the several occasions authorised by that prescription</td>
<td>Yes (228)</td>
<td>No (1)</td>
</tr>
</tbody>
</table>
9.2 Evaluation documents

9.2.1 GP survey

1. One or more of the patients attending my practice has received a prescription for diabetes related medicines from a diabetes nurse specialist.

Yes (30)
No (0)

2. How do you feel about patients who attend your practice receiving prescriptions for medicines from a diabetes nurse specialist?

I'm happy to have a diabetes nurse specialist prescribe medications (23)
I prefer to prescribe for my patients (4)
It’s best if the nurse checks with me first before prescribing any medication (3)
Not sure (0)

3. Do you think that diabetes nurse specialist prescribing brings any of the following benefits?
4. How knowledgeable do you think diabetes nurse specialists are about diabetes-related medications?

Extremely knowledgeable (11)
Very knowledgeable (16)
Moderately knowledgeable (3)
Slightly knowledgeable (0)
Not at all knowledgeable (0)

5. How confident are you that diabetes nurse specialists make appropriate prescribing decisions for your patients?

Extremely confident (5)
Very confident (16)
Moderately confident (8)
Slightly confident (1)
Not at all confident (0)

6. Have you agreed with the prescribing decisions made by diabetes nurse specialists for the following groups of drugs?

N = 26
7. How would you rate the communication of prescribing decisions from diabetes nurse specialists to you?

Excellent (6)

Very good (5)

Good (16)

Not very good (3)

8. Do you have any concerns about diabetes nurse specialists prescribing?

Yes (3)

No (26)

Skipped question (1)

*If you answered yes, what are your concerns?*

- No concerns provided I am informed about the prescription.
- Would like nurse script faxed to me for records. I prefer to prescribe for my patients but am happy for nurses to adjust insulin doses.
- So long as communication lines between doctor and nurse remain open should not be an issue.
- It must be directly communicated ideally the same day with the GP for seamless management and good rationale given to the GP [who] may well have reasons not to agree with suggestions of nurses. As always it’s a team effort.
- They need to be aware of the actions of other drugs that the patient is on too.
- A concern is follow-up - I think patients often slip through the cracks in the system. Common problem for diabetes patients at this practice and those seen by hospital. Need to ensure that treatment yields better results of HbA1C and outcome. Not sure this is always the case.

9. Which area is closest to where you practice?

- Hutt Valley region (8)
- Mid Central region (7)
- Hawkes Bay region (6)
- Auckland region (9)

10. How many years have you worked in general practice?

Average number of years = 20 (range 3 – 40).
9.2.2 Team Survey

1. I work in a team with diabetes nurse specialists who prescribe medications for people with diabetes.
   Yes (19)
   No (0)

2. What do you think about patients receiving prescriptions for medicines from a diabetes nurse specialist?
   I support diabetes nurse prescribing (19)
   I think doctors should prescribe medicines (0)
   It’s best if the nurse checks with the doctor before prescribing medication (0)
   Not sure (0)

3. What level of benefit do you think that diabetes nurse specialist prescribing brings for the following? (3 skipped question)
4. Have there been changes to how the team works now that some diabetes nurse specialists can prescribe medicines?

Yes (11)

No (7)

Not sure (1)

*If you answered yes or not sure, in what way does the team work differently?*

- I have received valuable up skilling from being alongside the prescribing pilot. I am delighted to have been able to come to the education sessions on lipid lowering and antihypertensive drugs. I now look for a lot more than glycaemic control when I review my patients. Along with the greater attention to medication, I am giving all patients a more thorough overview, because when I review the case with colleagues who are part of the pilot, they are asking the questions (regarding side effects and blood results) that they need to have when doing their assessments. So I have intensified my assessment because of the pilot. This has given me more confidence and I can’t wait for the wider results, if the pilot proves positive for the roll out of prescribing for other nurses in diabetes Note: I am CNS, newly appointed so did not qualify for pilot.

- More efficient time spent with the patient (i.e. not having to wait around to talk to a doctor). The team have had a huge amount of work to do. I have noticed that they are busy but this increased work load has been contained to the individual (not the wider team).

- Other nurses have to work more to cover for ones who can prescribe due to the extra stress and workload the prescribing nurses endure.

- More people in the team to access for a prescription.

- Less time used by nurses for assistance who are prescribers themselves. Gives me time for junior staff to access medical input.

- Easier access to prescriptions have made for better efficiency, we spend less time waiting for medical staff.

- Less delays in patients receiving scripts, more autonomy and decision making from DNSs.

- Less interruptions to my time. Patients are able to action treatment changes sooner rather than having to wait for the nurse to case review with a prescriber and then obtain a script.

- We have had some conflict in our team with non prescribing nurses behaving in less than helpful ways towards the prescribing nurses. This has been a challenge to manage.

- Less dependence on consultants and RMO’s. Faster turnaround on prescriptions.

- More holistic, looking at bigger picture for e.g. cholesterol and other CVD risk.
5. Do you have any concerns about diabetes nurse specialist prescribing?
Yes (5)
No (9)
Maybe (5)

If you answered yes or maybe, what are your concerns?

- I have some concern that prescribing may impact on the balance of nursing care/medical care that exists at present. To utilise prescribing benefits the patient as it prevents treatment delay and that is a good thing, but if it is adopted as an extension aligned to meet the gap in existing prescribers service i.e. doctors then this would not be ideal and would devalue the role of the Diabetes Nurse Specialist.
- I would be concerned about possible over confidence. Although clinical review with experienced Doctors and other CNS will and should still continue. ?supported by GP's.
- 1. Potential loss of education role if focus becomes more medical (time take up with medication consideration/prescribing) 2. Pressure on DNS's to prescribe when some may not want to or have enough support
- No concerns at all about nurse specialists prescribing, but I think if nurse prescribing is to be opened up to nurses more widely, care must be taken to ensure that the nurses participating are trained to the sort of high level that specialist nurses are (i.e. level 4 on the knowledge and skills framework).
- I totally support it but I don’t want the preparation for prescribing to be so onerous and time consuming that it discourages nurses from doing the other really important parts of their academic preparation e.g. psych, interview skills, etc. There is a danger that the preparation for prescribing will effectively 'medicalise' the diabetes nursing workforce.
- Workload increase on nurse specialists. I am aware that the project has been very intense for the nurse specialists in my service and hope that this would not be such a load as it becomes more standard.
- They should be qualified to the correct level to ensure advanced practice and patient safety. Should at least have post grad diploma. Have done pharmacology paper.
- I am uncertain of the pre-requisites that will be required for those wanting to prescribe, but would hope this would include post-grad assessment and diagnostic reasoning, pharmacology and bioscience papers. I also feel a short practicum of some description would be beneficial
especially prior to prescribing agents such as anti-hypertensives which the nurses may not know as well as the anti-diabetic agents.

6. Do you think that prescribing has changed aspects of diabetes nurse specialists practise (e.g. assessment skills, more attention to lab results, use of evidence/research material? If so, in what way?

- Yes, see comment above.
- For some this may be the case, but for those in existing placements and in my own case, I am aware of the need to address any anomalies with lab results and of the precautions to take when initiating new drug therapy and the side effects of these drugs. Most in ongoing education or assigned to specialist services will have access to current methods for care of patients with diabetes and other co-morbidities and will/should be practising evidence based nursing.
- Yes, through continuity of care and improved safety.
- More in-depth assessment. Additional study has increased knowledge and skills base
- Yes, in a positive way from my perspective, much more aware.
- Increased attention to assessment skills, lab tests and other co morbid conditions. It has made them look at the bigger picture.
- Yes, more thorough assessments, more attention to biochemistry.
- Need to look more deeply especially if prescribing medications. Lookout for drug interactions or side effects. More need for literature reviews.
- Yes definitely, all of the examples you list above!! Naturally you look more closely at lab tests if you are able to do something about them - same with assessment skills and reviewing evidence etc.
- All of the above
- They are now thinking more widely about aspects of diabetes outside of just the treatment of dysglycaemia (i.e. cardiovascular risk etc.)
- Yes, they report to me that they are paying more attention to the co-morbidities they can now directly manage as opposed to making recommendations for someone else to follow up on.
- It has focused and honed the skills of the participating nurses.
- Yes, practise has added stretch to use of skills and knowledge due to intensity of project and difference to previous practise. Confidence has clearly increased substantially over time in this area.
- As above.
Some have commented that it has strengthened their practice as nurses as they are able to practise and meet their patient’s needs more holistically.

7. My role in the team is:
Non prescribing nurse (12)
Endocrinologist/Diabetologist (2)
RMO (0)
Manager (0)
Team leader (3)
Other (2)
9.2.3 Patient survey

1. A diabetes nurse specialist at one of the diabetes centres has written a prescription for my medications
   Yes (89)
   No (0)

2. How do you feel about receiving your prescription for medicines from a diabetes nurse specialist rather than a doctor?
   I’m happy to have a diabetes nurse specialist prescribe my medications (86)
   I prefer a doctor to prescribe my medications (2)
   Its best if the nurse first checks with the doctor and then prescribes my medications (1)
   Not sure (0)

3. Which things are important to you when you get a prescription from a diabetes nurse specialist?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Ticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendliness</td>
<td></td>
</tr>
<tr>
<td>Clear explanations about the medications and how they work</td>
<td></td>
</tr>
<tr>
<td>Having someone who listens to me</td>
<td></td>
</tr>
<tr>
<td>Convenience</td>
<td></td>
</tr>
<tr>
<td>A skilled and competent practitioner</td>
<td></td>
</tr>
<tr>
<td>A thorough assessment of my needs</td>
<td></td>
</tr>
<tr>
<td>Having someone who is approachable</td>
<td></td>
</tr>
<tr>
<td>Training and qualifications</td>
<td></td>
</tr>
<tr>
<td>None of the above</td>
<td></td>
</tr>
</tbody>
</table>

4. How is the experience of receiving a prescription from the diabetes nurse specialist different from receiving it from a doctor? (81 responses)
   - My diabetes nurse specialist is able to give me the time and understanding I need to understand how my medications work and how they will affect my body, without the feeling of being rushed.
   - No cost. Communication in own language is explained well. Time is vital and feel appreciated and listened to (my problems).
   - I can communicate by phone, email or per orally and don’t need to make an appointment.
- She has the experience and the quality of life that needed for me to get well. Time to share her skills. Never giving up on me. Listens to me. Helps me when I am struggling with diabetes. Culture awareness.
- I am really not sure of any differences in receiving prescriptions from the diabetes nurse or my doctor.
- She is focussed and specialised in this field so I feel very very good. I feel that because she is specialised she will be up to date with all the things to do with diabetes. NOT like a GENERAL doctor.
- No cost. Have more time to explain my medicine. Ongoing phone contact for support and my own language.
- It is cost effective when being seen by a diabetes nurse specialist but going to the doctor you have to pay to see them. Sometimes all I need is a prescription but still have to pay to see the doctor.
- The cost, and sometimes the doctor don’t explain how the pills and insulin works. Nurse explains all of how and what I need and how the pills and medications is doing good for my diabetes.
- You can sit and talk with your nurse a lot longer than your doctor. I think nurses are more attuned to talk to me about my problems.
- No different.
- No difference. Both explain why I need what they prescribe.
- There is not much difference. It will be quicker from the nurse and doctors will not have to bother to write up prescriptions. Give them more time.
- The convenience is great and the lack of charges - as opposed to seeing my doctor is good.
- It’s alright. I don’t feel any different because my nurse is from the same country and she explains to me my meds every time I ask "what are they for". And she has always checks with the doctor before she prescribes it. Plus a bonus to it. The nurse that prescribes my meds I know her because she knows me very well. But if another nurse that's new to me, I will feel discomfort if she prescribes me new meds.
- The nurse has more experience to prescribe for diabetics than the average general practitioner.
- Easier and very convenient. Plus I haven't had to pay extra for a prescription unlike getting one from my GP.
- No cost. Language. Lots laughter.
- Easier and cheaper!
- Cost is less. She has more time to explain. She take the time to follow-up and call me for information.
- Cost effective. Easy access. Comfortable to talk to a Pacific nurse who understands my condition and my struggle.
- Having someone listen to me.
- No cost. Connection. Have time for me and listen to me. Lot of laughter make me happy. Speaks in my own language.
- Knowing what she's talking about. No pay. Understand my culture.
- It's easy for me to talk with the nurse in my own language and no cost for my visit and she is very friendly.
- She is a female.
- With my nurses I feel comfortable because she is a lady. I think she listens to me and I understand. She understands my culture and she has time to explain to me my medicine.
Purely convenience. A doctor is not always available and in some circumstances I need a prescription quickly (if I've run out of insulin or blood test strips) and I don't need an examination of my medication (because it's all sorted). I just need the product QUICKLY.

I'm getting the same information from both the nurse and doctor, so that's a good start. Plus the nurse I currently see is culturally aware of my culture.

Very convenient. GPs deal in many cases whereas diabetes nurse helps much better as the focus on only diabetes.

I feel they are, or should be competent in their area of expertise and up skilling continually in this area, giving them a specialist insight into diabetes. Whereas the doctor has a more general knowledge - general practitioner - who may or may not be in a position to keep up with all the new clinical data on diabetes and prescribing.

I have more information regarding side effects and what I can benefit from taking the prescribed medications, no rush, and I feel free to ask questions.

It appears a trained diabetes nurse is prepared to go into my meds more thoroughly and take a bit longer than the 15mins that a GP is prepared to give.

From nurse is more personal.

I would be happy to receive a prescription from either a Doctor or a Diabetes nurse specialist. However, a Diabetes nurse specialist might be more effective as they specialise in diabetes all the time.

The nurse has more time to discuss possibilities and consider other options. Don't have to pay for her service. She is nice and friendly and understands my needs.

Knows what is required. No wait time for doctor to sign.

The diabetes nurse specialist explain to you in your own language about the different kind of medication you take for diabetes and high blood pressure so that I understand fully how it works. Second, you don't pay like going to the Doctor. Thirdly once you see her she asked about your medication is still enough to last. She always remind to check my medications so that to make sure I had enough.

The nurse specialist seems to have more time to listen and offer a clear explanation for any blood sugar anomalies.

It's no different but when I see the specialist I get the medication at the same times.

No different, same professional care. The only problem I encountered that the nurse was not able to prescribe all the medications I require (doxazosin). And so I had to go the doctor just for that. When you're under the nurse specialists care its convenient to get all you require from the one place as you are going there regularly to monitor your glucose levels/insulin.

[my nurse] is right up with the play and is prepared to pass on her knowledge when she explains any changes to my medication. She is always in consultation with both my own GP and the Diabetes Specialist and only a phone call away if I need to talk to her urgently.

As explained in the above. Very easy to cope with.

Much more convenient, means I can avoid a second unnecessary trip to the doctor for just a script and the expense of seeing a doctor just for a repeat prescription or just because I have had to increase my insulin dose slightly. Far better patient care for diabetes is given by my diabetes nurse who is far more knowledgeable about my specific condition than my GP was. However it would be even more useful if the range of medication my diabetes nurse could prescribe was extended to include common medications that I also take (i.e. contraceptive pill), so that I don't need to visit two health care professionals (and waste their time) to get all my basic medications.

It's good because when they taught me to use the pen instead of syringe they wrote my new medications out. I didn't have to have it signed. They know what they are doing. Very confidential. They even came to see me in hospital when I was there.
I don't have to make an appointment with the diabetes nurse like I do with a doctor, which makes it faster.

More relaxed. Can ask questions more freely. Don't feel so hurried.

I think the diabetes nurse specialist has more time to go through my test results with me and explain where I need different insulins and what effect they will have.

I'm very pleased with my diabetes nurse.

She is helpful and friendly; feel more approachable than a doctor.

I didn't have to wait for the doctor to be available just to sign when I have already explained and talked to the nurse.

The doctor has more experience with my health

Don't have to pay. Convenient, I can ring my nurse I am working with, get a script and my sugar levels checked.

My specialist has prescribed by type of insulin and a starting dose. This has then been checked and adjusted by my diabetes nurse according to my test results over a fortnightly period. This can be done by a phone call and works really well. Any time I want advice the nurse is only a phone call away.

I would say it's better to receive the nurses' input, as all she does is diabetes and [is] generally on top of the situation than my GP. And for the general part of diabetes it's just fine.

I am happy to receive a prescription from a diabetes nurse because she is trained and qualified in this field.

Quicker and less stressful and knowing that it won't take days to get prescriptions.

It is great; I don't have to make an appointment with my doctor and have to wait to see him.

Also there is no cost. I’m saving myself at least a visit to the doctor when the diabetes nurse knows more about my history than him.

[name of nurse] at the diabetes lifestyle centre is great. She is much more accessible than a doctor - not to mention free. I can ring her with any problems and she is happy to discuss things over the phone, whereas I would have to make an appointment and go to see the doctor.

Being able to get an appointment with the diabetes nurse is easier and more convenient than with the doctor. Can normally see them the day I need a prescription and is of no cost. With GP could wait days for an appointment and would cost to see them - even a faxed prescription costs £.
5. Do you have any concerns about getting a prescription from a diabetes nurse specialist?

Yes (1)
No (88)
Not sure (0)

6. If you answered yes or not sure to question 5, what are your concerns?
- Sometimes, if it’s a new nurse who don't know me or I don't know her.
- Diabetes nurses are not available like going to a doctor. I can get an appointment with my doctor far easier than a diabetes nurse.
- None whatsoever! I know what I need, I just need it quickly without a fuss.
- That is quite OK with me.
- It doesn’t matter to me.
- I trust her for the experiences she has over these years and I know there is not much different for going to the doctor because she know very well, what she is talking about your medicine.

7. If I get my prescriptions from a diabetes nurse specialist ...

If I get my prescriptions from the diabetes nurse specialist ...

- It saves me time
- I make fewer trips
- There are fewer costs
- It’s more convenient
- I know the doctor and nurse communicate about any changes made to my ...

n = 83
8. How knowledgeable about diabetes medications is the diabetes nurse specialist?

- Extremely knowledgeable (72)
- Very knowledgeable (16)
- Moderately knowledgeable (0)
- Slightly knowledgeable (1)
- Not at all knowledgeable (0)

9. How confident are you that the diabetes nurse specialist made the best prescribing decision for you?

- Extremely confident (57)
- Very confident (28)
- Moderately confident (1)
- Slightly confident (1)
- Not at all confident (0)

10. Would you go to a diabetes nurse specialist in the future to get a prescription?

- Yes (86)
- No (0)
- Not sure (1)
- Skipped question (2)

11. Which area is closest to where you live?

- Hutt Valley region (18)
- Mid Central region (13)
- Hawkes Bay region (9)
- Auckland region (49)

12. What type of diabetes do you have?

- Type 1 (15)
- Type 2 (73)
- Gestational diabetes (1)
- Other (0)
13. How many years have you had diabetes?
   Average 14 years (range 1 – 36)

14. Are you male or female?
   Male (42)
   Female (46)
   Skipped (1)

15. Which category below includes your age?

16. Which ethnic group do you belong to?

Other ethnic group: Fijian Indian (1), English (1), Nuie (1), Phillipine (1), European (1).
9.2.4 Interview schedules

**Phase 1: Interviews with diabetes nurse specialists and diabetes physicians**

Interview questions will mainly concern the incorporation of nurse prescribing into service configuration:

1. How was the service organised prior to commencement of the project (referrals, collaboration, prescriptions)

2. How are things organised now

3. What changes needed to happen for DNS prescribing to start (this may be answered Q.2)

4. What is it about the service (or people in the service) that has helped with the move to DNS prescribing

5. How confident are you feeling about prescribing initially/at this time (how confident are you feeling about the nurses prescribing)

6. How do you feel about the added responsibility

7. Do you think there is adequate education and support for nurse prescribing

8. Any particular worries or concerns?
Phase 2: Second (telephone) interview with diabetes nurse specialists and diabetes physicians

The same DNS and diabetes physicians will be re-interviewed by telephone late in the project. Interview questions will be focussed first on service performance and move to personal views and satisfaction:

1. Has the programme unfolded as intended?
2. In what ways has the service/team changed?
3. Is the service more effective?
4. How has your workload changed?
5. Do you have more time for other duties?
6. Has nurse prescribing improved access for people with diabetes?
7. Did you receive the support you needed/expected (were you able to provide the support needed/expected)?
8. Did being able to prescribe change aspects of your (the DNS) practise (e.g. assessment skills, more attention to lab results, use of evidence/research material)?
9. Do you want to continue prescribing (should DNS prescribing continue)?
10. What other medications and/or devices would be useful for DNS to be able to prescribe or are not necessary?
11. Were there process problems (e.g. with pharmacies filling nurse prescriptions)?
12. What could be improved?
**Patient interviews**

Interviews by telephone with up to five users of the service will take place from each demonstration site towards the end of the project period.

1. What differences are there for you now that your nurse can prescribe your diabetes medications?

2. Do you like the change/ dislike the change?

3. What could be improved?

4. Is it more convenient for you to have the nurse prescribe for you (wait time)?

5. Is it more or less expensive for you now?

6. What kinds of expectations do you have when receiving a prescription from a nurse?
9.2.5 Ethics approval & related documents

27 April 2011

Dr Jill Wilkinson
School of Health and Social Services
Massey University
Private Box 766
Wellington

Dear Dr Wilkinson:

Re: Ethics ref: MEC/11/EXP/009 (please quote in all correspondence)
Study title: Evaluation of the Diabetes Nurse Specialist Prescribing Project.
Investigators: Dr Jill Wilkinson, Ms Jenny Carlyer, Dr Jeff Adams

This study was given ethical approval by the Multi-region Ethics Committee on the 4th of April 2011.

Approved Documents
- Expedited Review of Observational Studies Application Form

Approved Amendments
- Patient Information Sheet
- Patient Satisfaction Survey

This approval is valid until April 2013, provided that Annual Progress Reports are submitted (see below).

Amendments and Protocol Deviations
All significant amendments to this proposal must receive prior approval from the Committee.
Significant amendments include (but are not limited to) changes to:
- the researcher responsible for the conduct of the study at a study site
- the addition of an extra study site
- the design or duration of the study
- the method of recruitment
- information sheets and informed consent procedures.

Significant deviations from the approved protocol must be reported to the Committee as soon as possible.

Annual Progress Reports and Final Reports
The first Annual Progress Report for this study is due to the Committee by October 2011. The Annual Report Form that should be used is available at www.ethics.committees.health.govt.nz. Please note that if you do not provide a progress report by this date, ethical approval may be withdrawn.
A Final Report is also required at the conclusion of the study. The Final Report Form is also available at www.ethics.committees.health.govt.nz.

Requirements for the Reporting of Serious Adverse Events (SAEs)
For the purposes of the individual reporting of SAEs occurring in this study, the Committee is satisfied that the study’s monitoring arrangements are appropriate.

SAEs occurring in this study must be individually reported to the Committee within 7-15 days only where they:
- are unexpected because they are not outlined in the investigator’s brochure, and
- are not defined study end-points (e.g. death or hospitalisation), and
- occur in patients located in New Zealand, and
- if the study involves blinding, result in a decision to break the study code.

There is no requirement for the individual reporting to ethics committees of SAEs that do not meet all of these criteria. However, if your study is overseen by a data monitoring committee, copies of its letters of recommendation to the Principal Investigator should be forwarded to the Committee as soon as possible.

Please see www.ethics.committees.health.govt.nz for more information on the reporting of SAEs, and to download the SAE Report Form.

We wish you all the best with your study.

Yours sincerely

[Signature]

Lauren Koale
Administrator
Multi-region Ethics Committee
Email: multiregion_ethicscommittee@MOH.govt.nz
Evaluation of the diabetes nurse specialist prescribing project

Information about the survey
A project started in April this year that allows diabetes nurse specialists in four different sites around New Zealand to prescribe medications for the people they see who have diabetes. It is likely you have already been seen by a diabetes nurse specialist who was able to prescribe your medications without needing to get a doctor’s signature on the prescription.

A team of researchers from Massey University have been commissioned to evaluate this prescribing project. We would be grateful if you would complete the following survey which has questions about your experience of having a nurse prescribe your medications and the things that are important to you. As well, and if you are interested in participating, we would like to interview you on the telephone for a short time in more depth about your experiences and views about diabetes nurse specialist prescribing. An interview should take about 15 minutes and will be audio recorded and later typed up. We will keep the data secure and dispose of it after the final report is written and any subsequent publications.

Your rights as a participant in the evaluation
You are under no obligation to accept the invitation to complete the survey or be interviewed. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study if you are interviewed (up until the interview is transcribed);
- ask any questions about the study while you are being interviewed;
- provide interview information on the understanding that your name will not be used or any identifying details unless you give permission to the researcher;
- ask for the recorder to be turned off at any time during the telephone interview;
- have access to a summary of the project findings when it is concluded.

It is important you understand the risks to you as a participant in the evaluation. It is not very likely, but there is a small risk that if you are interviewed you could be identified in the report. However, the evaluation team will ensure no data will be linked to any particular person in the report. The benefit of participating in the evaluation is you will have an opportunity to have your say about the success or otherwise of the project so that lessons can be learned for any possible future rollout of this type of prescribing to other areas. The final report will be available on the Ministry of Health website and we can send a copy to each of the demonstration sites for you to read.

On the last page of the survey there is an invitation to talk on the telephone to a member of the evaluation team. If you fill out the form with your name, phone number and a good time to call, we will be in touch with you. Completing this form tells us you agree to participate in the study and understand the risks as explained above. If you have any questions about the interview process or any aspect of the evaluation, please do not hesitate to contact the evaluation team.

Dr Jill Wilkinson
School of Health and Social Services
Massey University, Wellington
Phone 04 801 5799 ext 6639
J.Wilkinson@massey.ac.nz

This study has been reviewed by the multi-region Health and Disability Ethics Committee, MEC/11/EXP009.
Invitation to talk to a researcher about diabetes nurse specialist prescribing

Thank you for completing and returning the survey about your experience of diabetes nurse specialist prescribing. You are now invited to talk to a researcher about your experience. We would like to know more about what you liked or didn’t like about nurses prescribing your diabetes medications and how the service could be improved.

Talking to a researcher would involve a short telephone call of about 15 minutes. The conversation will be recorded and we will use your ideas about diabetes nurse specialist prescribing in the report that is written about the project.

The researchers are from Massey University and are not involved in your diabetes care. You can choose not to answer any question and you can choose not to be called at all by leaving this form blank.

If you are happy to be contacted please write your name and phone number in the space below and post the form in the postage-paid envelope together with the completed survey.

**Write your name, phone number, area code, and best time to call.**

Name: ____________________________

Phone number: _______________________

Area code: ___________________________

Best time to call: _______________________

Thank you for taking the time to fill out the survey.

Your input is very much appreciated.
Evaluation of the diabetes nurse specialist prescribing project

INFORMATION SHEET for DNS & diabetes physicians

You will already be aware that the New Zealand Society for the Study of Diabetes Incorporated (NZSSD) has been commissioned by Health Workforce New Zealand to establish four demonstration sites to examine the safety and effectiveness of Diabetes Nurse Specialist (DNS) prescribing using a ‘designated prescriber’ model. This will allow DNS in the project demonstration sites to prescribe a limited number of prescription medicines that are used for health consumers with diabetes under the supervision of a medical practitioner. A key part of the project is an independent evaluation to determine the extent to which the desired project outcomes have been achieved. Implications for the future national roll-out of designated prescribing by diabetes nurse specialists will be made as part of the evaluation. The evaluation team are from the School of Health and Social Services at Massey University.

As a DNS or diabetes physician participating in one of the demonstration sites, you are invited to take part in an interview with a member of the evaluation team about your experiences related to DNS prescribing. We would like to talk to you on two occasions; at the beginning of the project in person (in May), and towards the end of the project (September) by telephone. We hope to talk to at least 3 DNS at each site and all the diabetes physicians involved in the project who agree to be interviewed. Each interview should take about half an hour and will be audio-recorded and later transcribed. We will keep the data secure and dispose of it after the final report is written and any subsequent publications.

Your rights as a participant in the evaluation

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study (up until the interview is transcribed);
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used or any identifying details unless you give permission to the researcher;
- ask for the recorder to be turned off at any time during the interview;
- have access to a summary of the project findings when it is concluded.

It is important you understand the risks to you as a participant in the evaluation. The risks are mainly about the publicity the demonstration sites have received and the subsequent difficulty of maintaining your anonymity as a participant. The evaluation team is unable to guarantee your anonymity, but we can ensure you are not easily identifiable in the report or linked to a particular demonstration site. We will use a composite thematic analysis wherever possible when presenting the findings. The benefit of participating in the evaluation is you will have an opportunity to have your say about the success or otherwise of the project so that lessons can be learned for any possible future roll-out of DNS prescribing to other areas. The final report will be available on the Ministry of Health website and we will send a copy to each of the demonstration sites for you to read.

If you do agree to be interviewed, a member of the evaluation team will contact you to arrange a suitable time. If you have any questions about the interview process or any aspect of the evaluation, please do not hesitate to contact the evaluation team.

Thank you for taking the time to consider participating.

Dr Jill Wilkinson  
Senior Lecturer  
School of Health and Social Services  
Massey University, Wellington  
Phone 04 801 5799 ext 6639  
J.Wilkinson@massey.ac.nz

Dr Jenny Carryer  
Professor of Nursing  
School of Health and Social Services  
Massey University, Palmerston North  
Phone 06 356 9099 ext 7719  
J.B.Carryer@massey.ac.nz

Dr Jeff Adams  
Evaluator/researcher  
SHORE centre  
Massey University, Auckland  
Phone 09 366 6136 ext 41362  
J.B.Adams@massey.ac.nz

This study has been reviewed by the multi-region Health and Disability Ethics Committee, ethics reference number MEC/11/EXP009.