Agency for Clinical Innovation

Evaluation of the Subcutaneous Insulin Prescribing Chart in Four Local Health Districts

Final Report

September 2015
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Executive Summary

Key findings and recommendations from the Evaluation of the Subcutaneous Insulin Chart:

1. The resources developed by ACI to support the implementation of the Adult Subcutaneous Insulin Chart focused upon introduction of a new Chart and inadequately considered the implications of the need to change practice, for example, the need for daily prescribing of subcutaneous insulin in all acute areas. The change from sliding scale insulin to supplemental insulin may not be well understood as observed during the chart audit. The ACI training resources should be modified accordingly.

2. Feedback from focus groups and results of chart audits suggests a lack of awareness and understanding about components of current best practice in the management of diabetic patients in a hospital setting outside of specialist Endocrinology units. This lack of awareness and understanding of the need for daily prescribing is considered a barrier to successful implementation. Improved understanding may have assisted acceptance. To improve implementation outcomes, training resources should be developed about clinical best practice in diabetes management, and distributed to all LHDs.

3. The implementation approach could benefit from:
   a. Clarification of the role and responsibilities of the LHD Executive Sponsor, Project Leads and Clinical Champions
   b. Increased project governance
   c. Ensuring ACI communications are delivered closer to the coalface to maximise audience and increase buy in
   d. Utilising the tools now available to ACI, namely the ACI evaluation framework as this may not have been available at time of implementation.

4. A key theme consistently emerging from focus groups conducted was that there would be benefit in reviewing the Chart to improve its readability and legibility.

Overarching Finding: The implementation of the Chart would have benefited from additional support and training to ensure that clinicians not specialising in Endocrinology understood best practice in diabetes management and processes were implemented to support this.

The Clinical Excellence Commission (CEC) has identified insulin as a high risk medicine, which has a high risk of causing injury or harm if it is misused or used in error. In response to this finding, the Agency for Clinical Innovation (ACI) Endocrine Network undertook an extensive review of insulin recording charts nationally and across NSW with the aim of developing best clinical practice - a standardised subcutaneous insulin prescribing chart (the ‘Chart’). The Chart was piloted at 2 Local Health Districts (LHDs) in 2012 (at Ryde Hospital and Royal Prince Alfred Hospital). The Chart is currently being implemented in all LHDs across NSW.

O’Connell Advisory was engaged by ACI to develop an evaluation plan and to undertake an independent evaluation of the implementation of the Chart within 2 LHDs. The 2 LHDs selected for evaluation by ACI in 2014 were Sydney LHD (SLHD) and Western NSW (WNSWLHD). Following feedback from the draft report, O’Connell Advisory was subsequently engaged to undertake the evaluation in a further 2 LHDs in early 2015, namely, Illawarra Shoalhaven LHD (ISLHD) and Northern Sydney LHD (NSLHD).
As it is understood that the Chart has only been introduced for state-wide rollout in November 2013, this evaluation should be considered formative. It is also understood that the evaluation will be repeated at a later date once the Chart has been in place for some time – enabling a summative evaluation.

The evaluation utilised a program logic approach which was developed following discussion with members of the ACI Endocrine Network. The agreed primary objectives of the Chart were:

1. To establish a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists
2. To reduce errors in insulin prescribing and administration
3. To improve documentation of insulin use and administration
4. To improve the awareness and management of glycaemic control (including the prevention of hypo/hyperglycaemia)
5. To improve daily monitoring of blood glucose for patients with diabetes
6. To improve daily monitoring of ketones for patients with diabetes
7. To improve awareness of clinical staff to insulin errors and adverse outcomes
8. To improve reporting of errors and adverse events in insulin prescribing and administration
9. To improve engagement of stakeholders using the Chart.

The Program Logic was used to define a set of evaluation questions clustered into groups representing key discussion points. The evaluation adopted a mixed methods approach comprising interviews and focus groups conducted with key stakeholders, and analysis of data from the Incident Information Management System (IIMS), user surveys and Chart audits. Evaluation tools were developed including a user survey, chart audit, pre-site visit questionnaire and interview guides, and these are provided in the Appendix of this report.

The stakeholders who were interviewed included the ACI Network Manager, LHD clinical champions, LHD Executives, LHD clinical educators, project implementation teams, pharmacists, nurses and medical officers. Nurses and doctors using the chart came from a range of clinical departments.

Key findings of the evaluation of the Subcutaneous Insulin Chart

- There was no evaluation framework developed for the Chart prior to implementation. If the evaluation framework had been developed, there would have been good baseline data available to inform this evaluation. This may have resulted in a more comprehensive evaluation of the pilot, resulting in issues with the implementation of the Chart being identified earlier.
- Feedback from focus groups and results of chart audits suggests a lack of awareness and understanding about components of current best practice in the management of diabetic patients in a hospital setting outside of specialist Endocrinology units. This lack of awareness and understanding of the need for daily prescribing is considered a barrier to successful implementation. Improved understanding may have assisted acceptance. To improve implementation outcomes, training resources should be developed about clinical best practice in diabetes management, and distributed to all LHDs.
- The resources developed by ACI to support the implementation of the Adult Subcutaneous Insulin Chart focused upon introduction of a new Chart and inadequately considered the implications of the need to change practice, for example, the need for daily prescribing of
subcutaneous insulin in all acute areas. The change from sliding scale insulin to supplemental insulin may not be well understood as observed during the chart audit.

- The resources provided to support implementation had the following limitations:
  - The ACI expectations regarding the role and responsibilities of the LHD Executive Sponsor, Project Leads and Clinical Champions were not clearly articulated
  - There was limited ACI project governance as evidenced by the limited project plans made available to the ACI Network Manager
  - There was only one ACI implementation workshop, held in Sydney and there was a limit of 3-4 representatives per LHD.

- The Chart has limited space to record key information, limiting its readability and legibility.

**Key Recommendations arising from this evaluation**

The evaluation has revealed areas of potential improvement to meet the objectives of the Chart:

- Provide training resources regarding best practice to clinical staff in the management of diabetic patients, including the rationale for daily prescribing and the use of supplemental insulin as opposed to sliding scale
- Develop resources to support the LHDs to develop a systematic approach to ensure daily prescribing occurs on a timely basis for all acute facilities, utilising accepted change management practices
- Review of the format of the Chart to improve its readability and legibility

Should the Chart be revised, it is recommended that another formative evaluation followed by a summative evaluation be conducted in LHDs to assess the Chart.

For future initiatives, ensure that an evaluation framework is developed prior to pilot, consistent with the ACI evaluation framework, noting this may not have been available when this project was being implemented.
1. Background

The Clinical Excellence Commission (CEC) has identified insulin as a high risk medicine, which has a high risk of causing injury or harm if it is misused or used in error. The CEC has undertaken an analysis of the Incident Information Management System (IIMS) database, which in 2010 identified nearly 3,000 incidents relating to insulin.

In response to this finding, the Agency for Clinical Innovation (ACI) Endocrine Network undertook an extensive review of insulin recording charts nationally and across NSW with the aim of developing best clinical practice - a standardised subcutaneous insulin prescribing chart (the ‘Chart’). This review included extensive consultation with key clinicians including those in metro, rural and regional locations.

The Chart was developed utilising a number key principles of insulin management for increased patient safety. These principles were:

- Combining the guidelines with the draft NSW subcutaneous insulin chart in order to minimise delay in management decisions and to reduce the risk of error
- Ensuring clinicians have a standard subcutaneous insulin medication chart for use within public hospitals in NSW.
- Ensuring clinicians without local guidelines have clear guidelines for insulin prescription and administration.
- Ensuring clinicians without local guidelines have guidelines for the management of hyperglycaemia and hypoglycaemia.
- Ensuring clinicians without local guidelines have a guide for safe use of supplemental insulin and correction of hyperglycaemia.

The guidelines were based on a format which had been tested and shown to be associated with better outcomes - the SWAHS subcutaneous insulin chart.

The Chart was developed and subsequently endorsed by the ACI Endocrine Network and the Medication Safety Expert Advisory Committee at the then NSW Department of Health in 2010. The Chart was piloted at two Local Health Districts (LHDs) in 2012 (across all of Ryde Hospital, and in three wards of Royal Prince Alfred Hospital – an antenatal, a general surgical and endocrine/renal ward). A rural facility agreed to participate in the pilot but then withdrew. An evaluation of the pilot was undertaken and reported. It was unclear what findings were actioned as a result of this report. Importantly, according to the evaluation report, the implementation process included the delivery of an education program to all nursing, medical and pharmacy staff that were anticipated to use the Chart during the pilot – however further detail was not available. The Chart was released for state wide implementation November 2013.

O’Connell Advisory was engaged by ACI to develop an evaluation plan in order to evaluate the success of the implementation of the Chart as a program, as no evaluation framework had been developed previously. O’Connell Advisory was also engaged to evaluate the implementation of the Chart within two LHDs: Sydney LHD (SLHD) and Western NSW LHD (WNSWLHD). As the Chart was implemented recently, this evaluation should be considered formative – that is evaluating the success of the implementation in the early stages, when changes can still be made to improve the success of implementation over the life of the program.
Following the release of the draft evaluation report, O’Connell Advisory was engaged to undertake the evaluation in a further 2 LHDs: ISLHD and NSLHD in 2015. This report incorporates the findings based on the data collected from all 4 LHDs.

It is understood that the evaluation will also be repeated at a later date once the Chart has been in place for some time, enabling a summative evaluation. This will be subject to ACI’s ability to resource further evaluations.
2. **Methodology**

A program logic approach was used to inform the development of the evaluation. This involved a meeting with members of the ACI Endocrine Network expert reference group on 20 May 2014. Members in attendance included:

- ACI representatives - Daniel Comerford – ACI Director of Acute Care Services, Rebecca Donovan – Endocrine Network Manager and John Marshall – Health Economics and Evaluation
- Members of the ACI Endocrine Network Executive
- Members of the ACI Endocrine Network with expertise in implementing the Chart; and
- Representatives of O’Connell Advisory.

Prior to the meeting, members were sent a draft program logic model that was developed by O’Connell Advisory using program documentation. Detailed discussion and input from meeting members led to a re-drafting of the model which is shown in Figure One below.

The agreed primary objectives of the Chart were:

1. To establish a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists
2. To reduce errors in insulin prescribing and administration
3. To improve documentation of insulin use and administration
4. To improve the awareness and management of glycaemic control (including the prevention of hypo/hyperglycaemia)
5. To improve daily monitoring of blood glucose for patients with diabetes
6. To improve daily monitoring of ketones for patients with diabetes
7. To improve awareness of clinical staff to insulin errors and adverse outcomes
8. To improve reporting of errors and adverse events in insulin prescribing and administration
9. To improve engagement of stakeholders using the Chart.

The Program Logic was used to define a set of evaluation questions clustered into groups (labelled by letters of the alphabet) which represent key decision points, as shown below. As this was considered a formative evaluation there was a higher focus upon inputs and activities. The body of the report discusses findings against the primary objectives in the body of the report however more detailed findings are available in as part of Appendix A of this report.
Figure 1 Program Logic developed for this evaluation

Implementation of the Subcutaneous Insulin Prescribing Chart

Aim: To provide safer and better patient care for adults with diabetes in hospital

Overarching objective: To implement the Chart to address the following specific objectives
- To establish a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists
- To reduce insulin prescribing and administration errors
- To improve documentation of insulin use and administration
- To improve the awareness and management of glycaemic control (including the prevention of hypo/hyperglycaemia)
- To improve daily monitoring of both blood glucose and ketones for patients with diabetes
- To improve awareness of clinical staff to insulin errors and adverse outcomes
- To improve reporting of errors and adverse events in insulin prescribing and administration (IMS)
- To improve engagement of stakeholders using the Chart

Inputs
- ACI Evaluation Framework
- Adult hospital patients with diabetes
- Clinical and administrative staff resources
- Clinical guidelines for diabetes
- Local data collection systems
- Executive support
- Audit and survey tools
- Hospital equipment (e.g. glucose meter, ketone testing)
- Expert Endocrinologist Reference Group
- Funding or in-kind support
- Availability of specialist endocrinologist service
- Pilot study
- The Chart
- Training resources
- Other conflicting ‘systems’

Activities
- ACI implementation workshop
- Engage LHD and hospital executives
- LHDs/hospitals establish implementation project governance
- Hospitals develop project management plan & timeline
- Hospitals develop communication strategy (e.g. newsletters, emails)
- Identify clinical champion(s)
- Engage potential users of the Chart
- Establish community of interest
- Identify clinical educator(s)
- Provide education to improve:
  - Awareness and management of hypo/hyperglycaemia;
  - Use of chart;
  - Reporting errors / AEs
- Patients identified appropriately for chart use
- Distribute chart & ensure availability
- Conduct ongoing program monitoring (e.g. use of audits, surveys)
- Conduct QI (e.g. EQUP)
- Conduct ongoing motivational activities at ACI, LHD & hosp levels

Outputs/Impacts
- ACI reports to MoH Exec
- Project & communication plans developed & delivered
- No. of LHDs & hospitals using the Chart
- No. of staff educated re:
  - Hypo / hyperglycaemia
  - Usage of Chart
- Satisfaction with training & use of Chart
- % eligible diabetes patients where Chart was used
- % of Charts completed correctly & consistently
- Usefulness of guidelines in Chart
- Awareness, knowledge & confidence re glycaemic control
- Awareness of clinical staff re insulin errors and adverse events
- % patient receiving daily prescribing where relevant
  (eg unstable diabetes)
- Daily monitoring of blood glucose & ketones for diabetes patients in hospital
- Reduced length of stay
- Reduced insulin prescribing and administration errors

Outcomes
- Engagement of all stakeholders in Chart use
- % of patients achieving glycaemic control
- Prevention of hypo/hyperglycaemia in hospital
- Reporting of adverse events & errors in insulin prescribing & administration
- A consistent approach to prescribing & administering SC insulin by all staff
- Reduced insulin prescribing and administration error
- Reduced adverse events
- Patient safety & quality care

Stakeholders:
- ACI (NSW Agency for Clinical Innovation)
- CEC, MoH (University of Health)
- LHD (Local Health District) Executives
- Hospital Executives
- Hospital Department managers
- VMOs
- Nurses, doctors, pharmacists
- Patients
For each evaluation question the source of information to answer the question was identified and an evaluation plan was developed. The evaluation adopted a mixed methods approach comprising interviews and focus groups conducted with key stakeholders, and analysis of data from IIMS, user surveys and Chart audits. Evaluation tools were developed including a user survey, chart audit, pre-site visit questionnaire and interview guides, and these are provided in the Appendices.

The stakeholders who were interviewed included:
- ACI Network Manager
- LHD Clinical champions
- LHD Clinical educators
- LHD and Hospital Project implementation teams
- LHD Executive including Director of Medical Services and Director of Clinical Governance
- Medical officers (including junior medical officers)
- Nurses
- Pharmacists.

For the interviews and focus groups, the LHDs were requested to select representation from relevant speciality areas; or to provide a representative sample of nurses, medical officers and pharmacists. Medical officers and nurses came from a wide range of wards and specialities including Emergency Department, orthopaedics, rheumatology, obstetrics and gynaecology, drug and alcohol services, mental health, oncology and cardiology.

Survey methodology
At commencement of the evaluation, a paper-based user survey (see Appendix) had been previously distributed by ACI and was in circulation in WNSWLHD. This survey was refined and distributed as an electronic survey to LHDs. During the evaluation, these surveys were received and analysed, together with the newly developed electronic survey. The survey was subsequently distributed to ISLHD and NSLHD.

143 paper surveys were received from a range of locations in WNSWLHD including Bathurst, Dubbo, Forbes, Gilgandra and Orange hospitals. The majority of respondents were nurses (85%), with 9% medical staff and 6% pharmacy staff as shown in Figure 1.

![Figure 2 Professions of the respondents to the paper survey in WNSWLHD](image)
There were 316 respondents to the electronic survey, with the majority of respondents coming from Illawarra Shoalhaven LHD (126), Northern Sydney LHD (89) and Sydney LHD (79), as shown in Figure 2. For the purposes of subsequent analysis the 22 responses from other LHDs were excluded.

The professions of the respondents are shown in Figure 3 – the majority of survey responses came from nurses (68%). Medical officers were less well represented (19%) however the representation from pharmacists seemed more proportionate (13%).

**Figure 3 LHDs of the respondents to the electronic survey**

![LHDs of the respondents to the electronic survey](image)

**Figure 4 Professions of the respondents to the electronic survey**

![Professions of the respondents to the electronic survey](image)

**Chart Audits**

As shown in Figure 5 Distribution of chart audits for each LHD most of the chart audits came from ISLHD (38% - 76 audits), followed by approximately equal proportions in WNSWLHD (28% - 56 audits) and NSLHD (25% - 50 audits).
Figure 5 Distribution of chart audits for each LHD

- ISLHD: 38%
- WNSWLHD: 28%
- NSLHD: 25%
- SLHD: 9%
3. Limitations of the Evaluation

Limitations of the Evaluation include:

- A late start – ideally an evaluation plan should be conducted well before implementation of a program. If this is done, then sufficient data can be collected including the capture of baseline data with which to compare against.

- The evaluation of the pilot was limited, and did not follow an established evaluation framework.

- Two different user surveys were distributed instead of one. The first survey was not as clear or as comprehensive as the second survey. Results had to be analysed separately.

- The audits for some LHDS were performed by hospital staff that may have had different interpretations of how to audit and record the information. The majority of audits for the latter 2 LHDS were undertaken by the evaluation team, including Kerry Newlin (acting ACI Endocrine Network Manager). Ideally an independent auditor should perform all audits.

- The responses to the audits and surveys from each hospital varied in number and quality.

- It is not known if the audits were completely random.
4. Key findings of the evaluation of primary objectives

Key findings from the evaluation of the Subcutaneous Insulin Chart:

1. The resources developed by ACI to support the implementation of the Adult Subcutaneous Insulin Chart focused upon introduction of a new Chart and inadequately considered the implications of the need to change practice, for example, the need for daily prescribing of subcutaneous insulin in all acute areas. The change from sliding scale insulin to supplemental insulin may not be well understood as observed during the chart audit.

2. Feedback from focus groups and results of chart audits suggests a lack of awareness and understanding about components of current best practice in the management of diabetic patients in a hospital setting outside of specialist Endocrinology units.

3. The resources provided to support implementation had the following limitations:
   a. The ACI expectations regarding the role and responsibilities of the LHD Executive Sponsor, Project Leads and Clinical Champions were unclear.
   b. There was limited ACI project governance.
   c. There was only one ACI implementation workshop conducted in NSW with a limit of 3-4 representatives per LHD.

4. The Chart has limited space to record key information, limiting its readability and legibility.

**Overarching Finding:** The implementation of the Chart would have benefited from additional support and training to ensure that clinicians not specialising in Endocrinology understood best practice in diabetes management and processes were implemented to support this.

The rollout of the Chart was primarily focused upon the introduction of a new form which was designed to support best practice care in the management of patients requiring subcutaneous insulin. However, feedback from focus groups suggested that for clinicians practicing outside of specialist endocrinology units, there was confusion about why daily prescribing would be necessary for hospitalised patients, and there were frequent references to “sliding scale”. It is understood that current best practice in the clinical management of diabetic patients requiring subcutaneous insulin includes:

- Daily prescribing of subcutaneous insulin on a timely basis to ensure timely administration
- Routine monitoring of Blood Glucose Levels (BGLs) and ketones; and
- Use of supplemental insulin when BGLs go over an indicated range.
- The ability to view all of the above in one area of the patient record, namely the subcutaneous insulin chart.

As there was a lack of understanding of the rationale for daily prescribing, systems and processes had not been established consistently across all facilities to ensure that for patients requiring subcutaneous insulin that daily prescribing was occurring consistently in a timely manner to facilitate timely administration. There was some recognition of the need for training of medical practitioners in best practice however this was not consistently applied across all LHDs. The fact that the
committee responsible for Chart design all primarily worked in Endocrinology and insufficient representation by rural and remote facilities in the piloting of the Chart could be considered contributing factors.

The lack of any evaluation framework developed prior to implementation, which may have allowed earlier identification of these issues at pilot could also be considered a contributing factor.

4.1 **To establish a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists**

The data collected through the focus groups conducted, surveys and chart audits all suggest that a consistent approach to prescribing and administration of insulin by staff has not been achieved. The ACI training resources focused upon how the Chart should be utilised, and there was limited references to best practice. The audits and feedback suggested that prescribing was not occurring in a consistent timely fashion. The audits identified there was not a consistent approach to administration, as there were instances where supplemental insulin prescribed was not being administered when the blood glucose levels (BGLs) achieved a certain range.

**Inputs**

*Scope of patients for whom the Chart was used:* The majority of patients for whom the Chart was used were adult diabetic patients on insulin. Some Chart use was for adult patients requiring blood glucose monitoring who did not require subcutaneous insulin to be prescribed particularly in NSLHD; and in 1 LHD for paediatric patients. Emergency Department medical officers were not consistently completing the Chart before patients were admitted to the ward. In the main, Preadmission Clinics were not using the Chart.

*Clinical and administrative staff resources:* Although ACI offered support to those responsible for the roll out of the Chart, LHDs did not identify ACI as a potential or actual provider of support for the implementation process outside of the workshops and package of resources provided. There seems to have been some misunderstanding regarding the time frames for roll out evidenced by the fact that LHDs reported different time frames to achieve implementation. Whilst ACI reported not stipulating a time frame for implementation, one LHD reported being given short time frames to achieve roll out. One LHD tasked one staff member with the operational responsibility for rolling out the Chart within the LHD, and was expected to do this whilst managing their existing workload. The LHD implementation plans as provided to the evaluator were varied in detail including which roles were tasked with various responsibilities, including more detailed communications. There may have been benefit in ACI providing some guidance to LHDs regarding the roles, responsibilities, and ensuing workload of the person(s) tasked with operational responsibility for roll out, either at a hospital or LHD level, including delivery of a communication strategy, including awareness raising, coordinating training and delivery particularly in larger LHDs.

*Local data collections systems:* Other than IIMS one hospital was identified as undertaking it’s own clinical audit to review utilisation of the Chart. Concord Hospital has an eMMS in its aged care wards and has incorporated some, but not all the features of the Chart into its system.

*Availability of specialist endocrinologist service:* Of the sites included in this evaluation, RPA, Royal North Shore Hospital and Wollongong Hospital have specialist endocrinologist service, and the endocrinology staff specialists led the implementation and training of the Chart in RPA and Royal North Shore for medical practitioners. At Royal North Shore, the specialist endocrinologist provided
training to other medical specialists about best practice in diabetes management, as well as about using the Chart\(^1\). In the ISLHD, staff of the Wollongong Diabetes Centre led the implementation of, and training about the Chart, in conjunction with Diabetes Educators. At WNSW, there was a limited specialist endocrinologist service available which meant the Chart’s implementation was predominantly driven by nursing staff, which may have been a limitation in gaining acceptance of the Chart by VMOs. It is considered possible that VMOs in rural areas, like many other clinicians outside of specialist endocrinology units, may not have been aware of changing standards of care for hospitalised patients requiring subcutaneous insulin, (namely the need for daily prescribing and utilising supplemental insulin as opposed to sliding scale) and the implications for utilising the Chart.

**Pilot study:** RPA was the only hospital consulted as part of this evaluation that participated in the pilot study. The evaluation of the pilot was limited to surveys which were mainly asking closed questions, chart audits and glucometric analysis. There were no open discussion forums which may have elicited wider discussion and feedback regarding the Chart’s implementation.

**Training resources:** ACI provided an information pack to LHDs which included sample Charts, handouts and a Training DVD which covered how to use the Chart. ACI also included the following resources on its website:

- A PDF version of the Chart
- An instruction guide which included
  - Summary overview of the Chart
  - Regular subcutaneous insulin orders
  - Supplemental subcutaneous insulin orders
  - Once only subcutaneous insulin orders; and
  - Telephone subcutaneous insulin orders.
- A one page FAQ (Frequently asked questions)
- Training slides
- A user guide; and
- A Training DVD.

All resources were sighted by the reviewer. The instruction guide and FAQ were succinct and brief in their messaging. The Training Slides and User Guides were more detailed. All focused upon how to correctly utilise the Chart. There was little mention or clarification of what was best practice.

The Training DVD was reviewed online by the evaluator. The soundtrack quality was poor. Whilst the quality of the video was sharp in the smaller original window, the size of the document was too small to be helpful. The quality of the video was poor when the window was expanded to full screen. The video soundtrack referred to best practice diabetes management on two occasions, but was focused on providing instruction upon how clinicians should use the Chart. The evaluator considered there would be benefit from a professional delivery which could include a more slow measured delivery of the narrative.

Although ACI offered assistance to LHDs to support implementation, no LHD reported taking up or utilising ACI to further support implementation. It was unclear what form of support was offered.

**Activities**

\(^1\) The Electronic survey results were tested to determine if this had an impact upon findings however the medical officer sample size for all participating LHDs were too small to provide statistically significant results, and the actual results not suggestive of any difference.
ACI implementation workshop, Identification of clinical champions: The limitation in the numbers of people who could attend the initial workshop was identified as an issue by those responsible for implementing the Chart in two of the four LHDs. This was a particular issue for WNSWLHD, as only 1 representative was sent. Conducting the workshop closer to workplaces, to allow wider participation across the LHD may have assisted the implementation process by providing more clinicians with a better understanding of what the Chart was designed to achieve, and obtaining wider buy in at the start.

Quality Assurance: 88% of diabetic patients on insulin were using the Chart which reflects a high uptake of usage of the Chart in LHDs. Some of the patients not having a Chart had a brief admission or were being transferred to another hospital.

Only 25% of audited Charts were completed correctly as per the Guidelines. In 73% of cases where the audited Charts were not completed correctly, the issues were with administration not being correctly documented. It was noted that where supplemental insulin was prescribed (when BGLs reached a certain range), the supplemental insulin was not always administered, and this is discussed further below in Section 4.4 Glycaemic Control.

Other than the ACI audits and survey, there were no other data collection, and limited quality assurance activities performed. Only 2 hospitals interviewed suggested there had been any quality assurance activities undertaken. Feedback from ACI suggests that those responsible for implementation of the Chart in various hospitals were unclear about whose role it was to analyse the results of audits undertaken. ACI was approached on 2 occasions by hospitals and asked if they wanted the audit results. Not all hospitals had undertaken audits post implementation of the Chart.

Outputs/Impacts
Usage of the Chart: The Chart was being used at Concord, Canterbury and RPA hospitals, and across WNSWLHD and NSLHD. It was unclear if the Chart had been implemented at Balmain Hospital at the time of the evaluation. The Chart was also being used in acute hospitals in ISLHD, but not in sub-acute facilities – it is understood these are exempted by the LHD. One participant in a focus group who had previously worked in a facility in SNSWLHD indicated that the Chart was not being used in that facility as the GP VMOs were refusing to use the Chart. It is unclear if that facility was an acute care facility or a long term facility.

It was not clear that all those participating in the evaluation were aware that there was an option to request exemption from the Chart, and that exemption would be considered for those facilities with long term residents.

Chart Guidelines and knowledge gaps: While some users found the Chart guidelines useful, some thought the Guidelines were not needed and “a waste of space”. In Orange Hospital there was some conflict with the hospital’s recently released guidelines which had different blood glucose level (BGL) thresholds. It was unclear where local guidelines had been adopted, whether the local guidelines
took precedence over those of the Chart. There was confusion around the use of supplemental insulin and sliding-scale insulin in many hospitals, suggesting further education is required.

Outcomes

Consistent approach to prescribing and administering: It was clear from the interviews and audits that a consistent approach to prescribing was not present. This was evident in all areas of the Chart – regular insulin, supplemental order, once only order and telephone order. The nurses in all focus groups found the Chart to be too busy, difficult to read (because of the small size of boxes) and not intuitive. Examples were provided which demonstrated that, due to the limited space availability that there was potential for misinterpretation, particularly when errors were corrected. One participant in a focus group advised that the size of the boxes would be a challenge for an ageing nursing workforce. Most preferred a chart with the same layout as the National Medication Chart (NMC) where drugs ran vertically and days ran horizontally, although those interviewed in the subsequent round of focus groups were more accepting when the rationale for the layout was explained.

4.2 To reduce errors in insulin prescribing and administration

From analysis of IIMS data, and feedback from focus groups it appears that the Chart has resulted in an increase in the number of errors in insulin prescribing and administration, which was not unexpected in the early stages of implementation. The results of reviewing the Charts made available for audit and feedback from the focus groups suggests that this is largely due to a failure to prescribe on a timely basis. There was no evidence of any systemic change management processes designed to ensure medical officers were prescribing insulin in a consistent manner on a daily basis.

Feedback at the second round of focus groups suggested that delays in insulin administration due to a failure to prescribe on a timely basis may not be reported on IIMS if this did not result in a poor clinical outcome for the individual(s) concerned.

Activities

Communication and motivational strategies, Community of interest, Education: It was identified that there was routine training made available by the LHD about the general reporting of errors and adverse events however the frequency of training was unclear.

Quality Assurance: 88% of patients with diabetes on insulin whose record was audited had the Chart used during their episode of care.

Outcomes

IIMS incidents: There was a relatively large increase in insulin-related IIMS incidents (up to twice) following implementation of the Chart, when compared to results pre-implementation of the Chart. From the IIMS data provided, these incidents were attributed to missed doses due to prescriber omission, missed doses because of administration error and incorrectly administered doses. It is suspected that there is under reporting of incidents involving subcutaneous insulin based on feedback given during the subsequent round of consultations, as outlined above.

4.3 To improve documentation of insulin use and administration

It is unclear whether there were improvements in the documentation of insulin use and administration, as there were no pre-implementation baseline measures. However, opportunities for improvement were identified. Staff feedback suggests that the current format and layout of the
chart is a barrier to good documentation. Improving font size and space to record results may have a significant impact upon documentation.

**Activities**

**Quality Assurance:** Only 25% of Charts audited were completed correctly as per the Guidelines.

**Communication and motivational strategies, Community of interest, Education:** The lack of consistency in the approach to training (i.e. compulsory for nurses but not for other professional groups at one hospital) may have had an impact upon the quality of the documentation. 54% (139) of survey respondents had received training on the chart (please refer Appendix A – Detailed Findings Section Outputs and Outcomes for further information. Of those respondents who had received training on using the Chart, 30% were very satisfied and 47% were somewhat satisfied with the training provided.

**Outputs/Outcomes**

**Outputs and Outcomes:** Medical, nursing and pharmacy staff considered that when thinking about the prescribing, administration or dispensing of regular subcutaneous insulin (as relevant to that professional group), that the Chart was more difficult to use than other medication charts.

**4.4 To improve the awareness and management of glycaemic control (including the prevention of hypo/hyperglycaemia)**

There was some indication that there were improvements in the awareness of glycaemic control. However, issues with daily prescribing were impacting upon the consistent achievement of glycaemic control. It was also unclear from the chart audits undertaken if there was an improvement in the management of glycaemic control as there was not always a response identified to BGLs falling outside of specified ranges. Addressing these issues should improve outcomes in the long term.

**Activities**

**Communication and motivational strategies, Community of interest, Education:** It was not uncommon to hear clinicians using the older outdated term “Sliding scale” in relation to insulin dosing, irrespective of the fact that the Chart, which had been implemented in some instances for well over a year, referring to regular subcutaneous insulin, and supplemental orders. This suggests there is not a good awareness of best practice in diabetes management outside of specialist endocrinology services and further training is required to ensure best practice is delivered in a systematic manner, which may require some change management.

**Outputs/Impacts/Outcomes**

**Daily prescribing:** Positive feedback of the Chart was received regarding BGLs being on the same chart as prescribing information and the promotion of basal-bolus prescribing. However, throughout the consultations it was heard that daily prescribing was not occurring routinely, resulting in missed or delayed doses, especially in the morning. This was initially attributed to low familiarity with the Chart, and the view that daily prescribing means that prescribing needs to occur in the morning, rather than within a 24 hour timeframe as discussed below.

It was noted that the medical staff may not have received adequate education as training about the Chart as this was not compulsory for all medical staff at any of the hospitals attended.
As outlined above, it is also suggested that outside of specialist endocrinology units there seems to be limited awareness of best practice in diabetes management. If this is the case, then it is possible that there has not been a systematic approach taken to support daily prescribing.

Feedback provided by Junior Medical Officers in focus groups suggests that daily prescribing means prescribing in the morning for a specific day. Changing clinical understanding of daily prescribing to being prescribing for a 24 period may result in a reduction in the number of missed morning doses. Ideally, this should fit with ward rounds/optimal prescriber availability. Issues remain for those facilities where there are insufficient medical staff rostered onsite to facilitate daily prescribing in a consistent manner. The lack of representation by smaller rural remote facilities in the pilot has resulted in a failure to identify and address the issues associated in these facilities.

It appears that the impact of the change required to ensure those patients requiring subcutaneous insulin can have their insulin prescribed and administered on a timely basis, has not been addressed in a systematic manner.

**Outputs and Outcomes:** 60% of staff responding to the survey identified that they had received training regarding glycaemic control. 77% of staff responding to the survey had read that the Chart guidelines (which include hyperglycaemia and hypoglycaemia management). 79% of those who had read the guidelines found them to be ‘very helpful’ or ‘somewhat helpful’.

**Glycaemic Control:** 40% thought that the Chart had not improved glycaemic control. The Guidelines provided on the back page of the Chart suggested interventions when BGL fell below 4 mmol/L (hypoglycaemia) and above 10 mmol/L (hyperglycaemia). 50 charts were specifically reviewed to determine if supplemental insulin had been written up, and when BGLs fell outside a specific range, if a corresponding action had been recorded:

- Only 20 of 50 (40%) charts reviewed had supplemental orders written up
- 14 of the 50 (28%) charts reviewed had a corresponding action recorded taken when BGL fell below 4 mmol/L, above 10 mmol/L in the absence of alternating supplemental orders, or when supplemental orders were written, above the indicated BGL range for intervention
- 3 of the 50 (6%) charts reviewed had one or more instances of BGL falling below 4 mmol/L but no corresponding action recorded on the Chart. It may have been that actions were undertaken and recorded elsewhere on the medical record as only the Chart was reviewed as part of this evaluation
- 33 of the 50 (66%) charts reviewed had at least one instance of the BGL being above either:
  - 10 mmol/L in the absence of supplemental insulin ranges being specified; or
  - where supplemental insulin ranges were specified, being above that specified range and no corresponding action had been recorded.

Overall, participants in the focus groups considered the Chart had the potential to improve glycaemic control, but this was yet to be realised as daily prescribing was not occurring on a timely basis in a number of hospitals. Improving compliance with supplement insulin and use of the guidelines for action when values occurred outside of indicated ranges would also improve glycaemic control.

33% of those responding to the electronic survey thought that the Chart promoted improved glycaemic control for patients.

One limitation of the Chart, identified through focus groups, was for patients requiring hourly or more frequent monitoring. The Chart had insufficient space for these patients and the Chart could
be supplemented with alternate mechanisms for BGL monitoring. There was an inconsistent approach to how the more frequent BGL monitoring was being recorded between hospitals.

4.5 To improve daily monitoring of blood glucose for patients with diabetes

Outputs/Impacts
There was evidence of daily monitoring of blood glucose for patients with diabetes.

Daily monitoring: Blood glucose monitoring was often performed. In some, but not all facilities, the Chart was used solely for the daily monitoring of blood glucose.

Quality Assurance: 94% of charts audited showed blood glucose was monitored daily.

Feedback from several focus groups was that the Chart did not allow BGL monitoring more frequently than the boxes provided (14 times a day), and there were some instances when hourly monitoring was required. In these cases, alternate records could be used to monitor BGL, resulting in an inconsistent approach.

4.6 To improve daily monitoring of ketones for patients with diabetes

Outputs/Impacts/Outcomes
There was no evidence of routine monitoring of ketones.

Daily monitoring: Ketone monitoring was rarely performed.

Quality Assurance: 2 of 50 (4%) charts audited showed monitoring of ketones.

The monitoring of ketones was rarely done mainly because users believed that it was not indicated. Some wards had a lack of equipment to monitor ketones.

4.7 To improve awareness of clinical staff to insulin errors and adverse outcomes

Outputs/Impacts/Outcomes
There was some limited evidence from feedback from focus groups to suggest the Chart had improved the awareness of clinical staff to insulin errors and adverse outcomes. Feedback from focus groups suggested clinical staff were aware of insulin errors and adverse outcomes.

Outcomes and Outputs: 31% of staff surveyed felt that the Chart improved their awareness about the importance of identifying and reporting insulin prescribing errors and adverse events. 53% of those surveyed said the Chart did not improve awareness.

4.8 To improve reporting of errors and adverse events in insulin prescribing and administration

Outputs/Impacts/Outcomes
It is unclear of there has been an improvement in the reporting of errors and adverse events in insulin prescribing and administration.

Outcomes and Outputs: 69% of staff surveyed did not think the Chart improved the recognition of errors in insulin prescribing.
IIMS incidents: There was a relatively large increase in insulin-related IIMS incidents (up to 100% increase) following implementation of the Chart when compared to results pre-implementation of the Chart. These incidents were related to missed doses because of prescriber omission; missed doses attributed under IIMS to administration error; and incorrectly administered doses. It is suspected that there is under-reporting of incidents involving subcutaneous insulin based on feedback from the subsequent round of consultations. Clinicians reported using judgement when reporting, and would not necessarily report an error if they considered it a one off and there was no adverse outcome to the patient.

4.9 To improve engagement of stakeholders using the Chart

Outcomes
It is unclear if there was engagement of all stakeholders using the Chart. There was clear evidence of a systemic approach to ensure awareness, and training delivered to assist in Chart utilisation for nursing and pharmacy staff. However, it is unclear if the rationale for the change and anticipated outcomes had been clearly communicated.

There was no evidence of a systemic approach undertaken to improve engagement of medical officers in all LHDs. Junior medical officers were provided with training on the Chart, but this was not always mandatory.

Engagement of medical officers may have improved if there were:

- Training delivered regarding best practice in the management of diabetic patients requiring subcutaneous insulin. It was noted that this did occur in some facilities but the delivery was subject to the amount of time allocated by the medical officers for this training, and in some cases may have been limited
- More sophisticated tools available to support the delivery of a multi-faceted communication strategy to ensure all key stakeholders had a clear understanding of the rationale for change, impact and anticipated outcomes of implementing the Chart
- Process redesign to ensure that daily prescribing of subcutaneous occurred in a systematic timely manner

It should be noted that the introduction of the Chart assumes that there are sufficient medical officers available to prescribe on a daily basis. It was noted that some issues were identified with some facilities when limited medical officer coverage was available after hours and on weekends. Feedback suggested the workload of the medical officers rostered during those times provided insufficient capacity to prescribe during those hours, resulting in delays to administration in mornings. Feedback also suggests that in some remote facilities, medical officers do not routinely visit facilities on a daily basis.

It is noted that the initial pilot did not include any rural or regional facilities. Feedback from some regional/remote facilities indicates that there is resistance to the concept of daily prescribing from the Visiting Medical Officers, particularly when the patient is considered stable. Piloting at rural/regional facilities may have identified these issues, and strategies to address these issues.

Inputs

Executive support: It was considered that there may have been some variance in the level of LHD executive support and buy-in for the implementation of the Chart. This may have been due to a lack of guidance regarding the expectations ACI had upon what role the LHD Executive should take in
relation to roll out, and each LHD seems to have taken a different approach. ISLHD executive support was valued by the implementation team who reported that the ISLHD actively reinforced that the Chart was mandatory for all acute facilities to medical officers who were expressing some reluctance to adopt the Chart in their facility. NSLHD executive support ensured that a key endocrinologist was involved in educating medical officers throughout the district (as available) not only on utilising the Chart, but providing some training on best practice diabetes management.

Activities

Project governance, project management plan and timeline: RPA and WNSWLHD had a formal project plan which involved a staged rollout over 3-6 months. On review by the Evaluator, these plans appear to be reasonable in terms of phases, roles and communication strategies. However, additional resourcing to support implementation may have improved implementation outcomes. WNSWLHD formed a Steering Committee from key stakeholders to guide implementation of the Chart, including LHD Executive representation. However, the LHD Executive did not have buy-in to the Chart at time of implementation. This buy-in could have strengthened the implementation process. A formal project team was set up in ISLHD and the roll out of the Chart and a formal project plan was developed. The roll out of the Chart was overseen and monitored by the project team. Due to staff changes at NSLHD, the majority of the project team responsible for the roll out of the Chart were unable to be interviewed.

Communication and motivational strategies, Community of interest, Education: Outside of the clinical champions the motivation of users to adopt the Chart was found generally to be low during the implementation. The Chart was seen as ‘another chart’ which was not relevant to the non-endocrine specialities. The lack of training for some professional groups, and the lack of satisfaction with training provided by medical officers and nurses surveyed, suggests there are opportunities for improvement to engage stakeholders further.
5. Recommendations

The following section outlines recommendations arising from this evaluation.

The evaluation has revealed areas of potential improvement to meet the objectives of the Chart:

- Review of the format of the Chart to improve its readability and legibility
- Provide training to clinical staff about what is now best practice in the management of diabetic patients, including the rationale for daily prescribing and the use of supplemental insulin as opposed to sliding scale
- Develop resources to support the LHDs in developing a systematic approach to ensure daily prescribing occurs on a timely basis for all acute facilities
- Provide guidance to LHDs about seeking exemption for those facilities with long term patients
- Amend the chart to include advice that the Hypoglycaemia and Hyperglycaemia Management Guidelines are provided as guidance in those areas where no local guideline is available to reduce the potential for conflict.

Should the Chart be revised, it is recommended that another formative evaluation followed by a summative evaluation be conducted in LHDs to assess the Chart.

The evaluation has also highlighted a number of key lessons for the implementation of future charts with learnings for ACI, Local Health Districts and Hospitals.

5.1 Subcutaneous Insulin Prescribing Chart

The data analysis required for this evaluation has identified areas of potential improvement to meet the objectives of the Chart:

- Review of the format of the Chart, in particular:
  - its size and readability (largely supported by key stakeholders)
  - its orientation (largely supported by key stakeholders)
  - the option to graph BGLs (some support by key stakeholders)
  - the location of BGLs relative to doses (some support from key stakeholders)
  - the colour of the spine of the Chart to distinguish it from other charts
  - including an option for doctors to specify the frequency of ketone monitoring
  - reducing the space of taken by the ‘Hypoglycaemia Treatment Record’

- Amend the chart to include advice that the Hypoglycaemia and Hyperglycaemia Management Guidelines are provided as guidance in those areas where no local guideline is available to reduce the potential for conflict

- Develop resources to provide training to clinical staff about current best practice in diabetes management, as a significant number of clinicians working outside of Endocrinology did not have a clear understanding of the need to daily prescribe and the use of supplemental insulin as opposed to sliding scale. Having a better understanding of the rationale for daily prescribing may have improved acceptance of the Chart, which was designed to support best practice

- Local Health Districts undertake a review, using the ACI Chart Audit too developed to ensure that daily prescribing occurs in a systematic, consistent and timely manner. Consider determining which positions are responsible for undertaking these duties, and timing.
Consider approaches for those facilities where there may be limited on-site medical cover after hours, during weekends and public holidays

- Training doctors that daily prescribing is for a 24 hour period not a physical day and should fit with ward rounds/routine prescriber availability to maximise patient outcomes.

5.2 Future Evaluations of the Subcutaneous Insulin Chart

Undertaking the evaluation has allowed the refinement of the evaluation plan and tools. Should the Chart be revised, it is recommended that another formative evaluation followed by a summative evaluation be conducted in LHDs to assess the Chart.

Some of the Chart objectives are difficult to measure without having staff perform an objective assessment – viz. Objective 7 (To improve awareness of clinical staff to insulin errors and adverse outcomes) and 8 (To improve reporting of errors and adverse events in insulin prescribing and administration). The increase in insulin-related IIMS incidents may not have necessarily resulted from improvements in these objectives.

As part of the summative evaluation it may be worthwhile considering the addition of a question to the Chart Audit – “Did the incorrectly completed chart have errors which in the reviewing clinician’s opinion could have placed the patient at significant risk of having an incident with at least moderate consequences”.

The evaluation has highlighted a number of key lessons for the implementation of future charts.

5.3 Learnings for ACI

- Ensure that any project which requires change to clinical practice is supported by the development of an evaluation framework prior to implementation of the change process
- Any project designed to support clinical best practice should consider if the whole target audience would reasonably be up to date with current best practice; and if not, ensure there are implementation resources provided including training materials to inform the target audience about current best practice. Consider when introducing best practice whether some process redesign is needed, and if so, the resources should be made available to support this
- Any change should ensure that the rationale for change is clearly articulated and communicated to all key stakeholders to maximise buy in. A comprehensive communication strategy tool will support stakeholder buy in
- Any project which is potentially a state-wide project should include rural representation in piloting
- Consider providing more detailed implementation plans for LHDs to populate, and monitor progress periodically through to evaluation
- Implementation strategies are required to be delivered as close to the implementation sites/areas as possible. Consider small local LHD/Hospital based workshops rather than state wide workshops.
- Consistency of implementation across LHDs may be improved through providing more detailed guidance about ACI’s expectations regarding the implementation roles in each LHD.

2 PD2014_004 NSW Health Incident Management Policy
5.4 Learnings for LHDs and Hospitals

- Opportunities should be created to ensure the messaging regarding rationale for change is received by all key stakeholders.
- The LHD Executive Sponsor ideally should be part of the Implementation team, and monitor, or be provided with progress reports, periodically through to LHD evaluation.
- A review of existing guidelines or charts, which may conflict with, or delay the implementation of a new process, will help identify and develop management strategies to minimise any potential roadblocks.
- Ensure that new processes which require significant change for clinicians are supported through adequate training for all user groups. This training should be mandatory for key users.
- Consider incorporating clinical changes into ongoing education delivered to clinicians entering the workplace, and mandatory refresher training.
- As part of the quality plans and continuous improvement, consider involving those responsible for clinical audits, and utilise any clinical audits developed to measure the success of the implementation process.

It is important that ACI and LHDs/hospitals collaborate closely to tackle issues that may arise and maintain open lines of communication throughout the implementation process.
6. Appendices

Appendix A  Detailed Findings

Findings from the surveys, audits and interviews have been reported in clusters where relevant, as defined by the alphabetically-coded groups in the Program Logic.

Scope of patients using the Chart (A)

What is the trigger for the Chart to be utilised for a patient (i.e. how are patients identified as appropriate for the Chart)?

Interviews: The Chart was predominantly used for adult diabetic patients on insulin, although some nurses reported that patients requiring blood glucose monitoring were also candidates for the Chart. In WNSWLHD, there was mention of the benefit of the Chart in paediatric patients using insulin. The paediatric specialists were very supportive of the Chart as they felt there was significant benefit for patient care, however it was noted that the adult guidelines on the Chart were not used by paediatric clinicians. In NSLHD the trigger to use the Chart was any patient requiring BGL monitoring.

Who decides? When do they decide?

Interviews: The trigger for using the Chart was the patient being prescribed Subcutaneous Insulin, or for some LHDs those patients identified as requiring BGL monitoring. Due to limited awareness of medical staff, initially nursing staff would need to direct prescribers to utilise the Chart until they became familiar with the format.

How is the Chart implemented for patients who present via ED?

Interviews: Before admission to the ward from Emergency Department (ED), it is expected that ED medical officers write up the Chart. However this was not being done in all cases.

Does the preadmission process identify booked patients who will require S/C insulin during their hospital stay?

Interviews: In Preadmission Clinics, the Chart was not always used for diabetic patients on insulin, and only included in the pre-admission packs for one service.

Clinical and administrative staff resources (B)

What staff resources were allocated to assist with implementation and the chart/project management? Are any resources allocated ongoing? If so what?

Interviews:

ACI advised that they have offered support to those responsible for the roll out of the Chart in each LHD however there was limited take up. ACI advised that there was no time limit stipulated for implementation.

The general feedback from LHDs was that there were insufficient staff resources allocated by the LHD to implement the Chart over a short period of time. In WNSWLHD, it was reported that the implementation had to commence just before Christmas when many staff were on leave and that it was understood that there was 3 months to complete the implementation. There were also other clinical initiatives being rolled out at the same time (e.g. sepsis chart in WNSWLHD, venous thromboembolism prophylaxis and ‘Medication history and reconciliation forms’ at Concord
Hospital). All staff involved in the roll out of the Chart were expected to do this in addition to their existing workload. Feedback from LHDs suggested there seemed to be limited guidance from ACI regarding expectations of roles and responsibilities of the implementation team.

Some of the clinical champions were working part-time and had their existing workload to manage. In WNSWLHD there was one staff member who was responsible for driving the implementation of the Chart in multiple regional sites (~40) over a geographically large district.

**Local data collections systems (C)**

*Are there any local data collection systems that are relevant or useful to the Chart? If so, what?*

**Interviews:** Insulin prescribing and administration errors are reported through IIMS – excerpts of these data have been analysed in the relevant section of this report.

Concord Hospital is operating an Electronic Medication Management System (eMMS) in its aged care wards and has incorporated some features of the Chart into its system. To assist with administration, missed doses are highlighted ‘red’ and there is the requirement for two staff to electronically sign orders. The orientation of the online chart is similar to National Medication Chart (NMC) with drugs running vertically and dates running horizontally. The eMMS project manager reported an improvement in patient safety with the system and highly satisfied end-users. It is understood that at time of writing that not all features of the Chart had been able to be replicated within the eMMS.

**What other systems exist that potentially conflict with Chart implementation?**

**Interviews:** In NSLHD, the form used by Royal North Shore for insulin prescribing and administration also included insulin pumps. The timeframe for implementation was insufficient to have an alternate form developed, approved and implemented at time of roll out of the Chart. This caused some internal confusion.

**Executive support (D)**

**Interviews:**

ACI advised that there had been correspondence with LHD executive regarding the roll out of the Chart, however the focus was on the introduction of a new form to support best practice, not recognising that generally outside of specialist endocrinology services there seemed to be a lack of awareness of best practice (this is discussed further in Training below). ACI reports that all LHD nominated executive sponsors for this project. However it was identified that there was limited guidance provided about the expectations ACI had in relation to the role and responsibilities of the LHD Executive sponsor. Further guidance may have been helpful in supporting implementation.

The implementation teams reported varying levels of Local Health District executive support and buy-in for the implementation of the Chart. There were reports of the request for implementation “being left on executives desks” for weeks before being dealt with. In WNSWLHD, it was made evident that the importance of the Chart had not been adequately communicated to the executive staff, leaving them unconvinced about its benefits to their LHD and therefore finding it difficult to engage with VMOs of smaller facilities who were opposed to the requirements of the Chart. It is now considered likely that these VMOs may also be unaware of the need to undertake daily prescribing for patients requiring subcutaneous insulin and the use of supplemental insulin as opposed to sliding scale.

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3 “60% decrease in prescribing errors and a 40% decrease in severe prescribing errors”
It was noted that at the hospital level, a hospital Director of Medical Services provided significant administrative support to the implementation process. In ISLHD, the commitment and support of the Executive was seen as being critical to the success of the project, as they would enforce the need for the Chart to be utilised by medical officers in the ISLHD facilities which had implemented the Chart. However this was not always the case.

Is there any LHD executive sponsor of this project? Who? What is their involvement?
At Sydney LHD the Director of Clinical Governance was identified as having executive responsibility for the project, but was not considered by the Evaluators to be a sponsor as they did not have any ongoing involvement in the project. At WNSWLHD the LHD Director of Medical Services was part of the implementation team. It was unclear who were the executive sponsors at ISLHD and NSLHD.

Availability of specialist endocrinologist service (E)

Does the hospital/LHD have a specialist Endocrinology service? If so, what services are provided and on what basis (f/t, p/t, sessional)? If not, what services/supports are available to clinicians treating people with diabetes?

Interviews: The RPA has a specialist endocrinologist service and the endocrinology staff were key drivers in the implementation and training of the Chart in RPA, including the staff specialist and clinical nurse educator who works in both renal and endocrinology. Some specialties on the ward believed that it was the responsibility of the endocrinology staff to administer the Chart for their patients with diabetes. This often did not occur resulting in missed or delayed doses and poor glycaemic management. Concord Hospital also has a specialist Endocrinology service. Canterbury Hospital has a visiting Endocrinologist who provides services on a sessional basis.

For WNSWLHD there is an Endocrinology staff specialist at Dubbo Base Hospital, with Endocrinology VMOs providing sessional services once to twice a month for some of the other hospitals on a fly in fly out basis. All the Base Hospitals have diabetes nurse educators who can provide support to clinicians treating people with diabetes. However the limited medical specialist availability may have limited the valuable peer to peer communications which occurred within other Local Health Districts, particularly updating those medical officers without current specialist clinical expertise in Endocrinology about current best practice.

For NSLHD there was a specialist endocrinology service at Royal North Shore Hospital. There were specialist diabetes educators/clinical nurse specialists at Hornsby and Mona Vale Hospitals.

For ISLHD there was a Wollongong Diabetes Centre which included an endocrinologist, diabetes educators and other clinical supports. There was a sessional endocrinologist at Shoalhaven Hospital, supported by a regional diabetes educator.

Pilot study (F)

Was the hospital a participant in the pilot?

Interviews: RPA was the only hospital consulted as part of this evaluation that participated in the pilot of the Chart.

Training resources (G)

What training resources were available at time of implementation?

Interviews: The training of users of the Chart was conducted by nurses and medical officers including clinical nurse educators, diabetic educators, endocrinology medical officers and pharmacists. These
people may have attended the initial ACI workshop, although given there was a limit of 3 people per LHD it is considered unlikely that all those involved in delivering training had attended the workshop. WNSWLHD reported only sending 1 participant to the workshop due to the travel time required to attend.

**Training resources:** ACI provided an information pack to LHDs which included sample Charts, handouts and a Training DVD which covered how to use the Chart. The handouts were not described, but the discussions with LHD implementation teams suggested that the FAQ and instruction guides were included.

ACI also included the following resources on its website:

- A PDF version of the Chart
- An instruction guide which included
  - Summary overview of the Chart
  - Regular subcutaneous insulin orders
  - Supplemental subcutaneous insulin orders
  - Once only subcutaneous insulin orders; and
  - Telephone subcutaneous insulin orders.
- A one page FAQ (Frequently asked questions)
- Training slides
- A user guide; and
- A Training DVD.

All resources on the website were sighted by the reviewer. The instruction guide and FAQ were succinct and brief in their messaging. The Training Slides and User Guides were more detailed. All focused upon how to correctly utilise the Chart. There was little mention or clarification of what was best practice.

The Training DVD was reviewed online by the evaluator. The soundtrack quality was poor. Whilst the quality of the video was sharp in the smaller original window, the size of the document was too small to be helpful. The quality of the video was poor when the window was expanded to full screen. The video soundtrack referred to best practice diabetes management on two occasions, but was focused on providing instruction upon how clinicians should use the Chart. The evaluator considered there would be benefit from a professional delivery which could include a more slow measured delivery of the narrative.

Although ACI offered assistance to LHDs to support implementation, no LHD reported taking up or utilising ACI to further support implementation. It was unclear what form of support was offered.

The training materials focused upon the introduction of a new form designed at supporting best practice in the management of diabetic patients requiring sub-cutaneous insulin. What was not recognised was that outside of specialist endocrinology units, there was limited awareness of the need for daily prescribing, and the use of supplemental insulin as opposed to sliding scale. Therefore there was a disconnect implementing a form, designed to support current best practice, when such practice was not necessarily being delivered due to a lack of general awareness. Current work practices did not always support the provision of daily prescribing in a consistent manner.

NSLHD’s approach to training medical officers about the Chart, through delivery of training to all medical specialty groups on current best practice in the management of patients, subject to the time
made available for such training, was considered effective as it focused on best practice delivery with the introduction of the Chart to support this practice rather than just introducing a new form. Unfortunately this seemed exceptional, was more successful at Royal North Shore Hospital as the key endocrinologist was based at the hospital and therefore more readily accessible, and was limited to medical staff.

WNSWLHD reported a shortfall in the number of information packs provided by ACI. WNSWLHD also suggested this would be improved through including FAQ posters to address issues such the difference between sliding scale and supplemental insulin.

RPA Hospital developed its own resources for staff training and support including posters. However some RPA staff did not see the benefit of having Chart posters in the wards in the presence of many other existing posters, as the message was diluted.

Whilst the feedback from the LHD implementation teams was that the training slides and posters were used to support implementation, there was no mention of the DVD, User Guide or FAQs being used as part of the training.

Were any extra resources provided for this project (e.g. staff, funding/in-kind support)?
Interviews: No extra staffing or funding resources were provided for training at the LHD level. There was no mention made of the offer made by ACI, to provide further support to the implementation of the Chart.

**ACI implementation workshop (H), Identification of clinical champions (K)**

Who from the LHD/Hospital attended the ACI implementation workshop? (WNSWLHD?) Is/was there a clinical champion? If so, how were they identified and engaged? What was their role?

Interviews:
ACI conducted one implementation workshop and up to 3 clinicians per Local Health District were invited to attend. It is suggested that there was limited guidance provided about who should attend, and as a result there may have been limited representation from those not specialising in endocrinology who may have assisted in the identification of the disconnect between introducing a chart to support best practice, when the feedback suggests limited understanding of best practice outside of specialist endocrinology services.

The role of clinical champions to coordinate and drive the implementation was adopted by nurses, medical officers and a Chronic Care Manager (WNSWLHD). There were clinical champions at RPA and Concord (Endocrinologist) and Canterbury Hospitals (Pharmacists), and at WNSWLHD (Chronic Care Manager and Physician). Some clinical champions were self-appointed, having been involved in the initial design of the Chart through participation in the ACI Endocrine Network or other ACI activities. Others became champions through their nomination by LHD or hospital executive to be responsible for the roll out of the Chart throughout their jurisdiction.

The RPA identified a limitation in that only 3 people from any LHD were allowed to attend the ACI Implementation workshop. As there were 2 clinicians from RPA who were instrumental in the pilot already presenting at the workshop it was considered that there could be no further representation from RPA. Subsequently 4 further representatives from SLHD attended the workshop in addition to the 2 clinicians presenting.
There did not seem to be any direction from the LHD about who should attend these workshops, and therefore the decision about who would attend was left to the hospitals. The RPA project team identified there was a lack of clarity about how clinical champions should be chosen.

Canterbury Hospital was represented by 2 pharmacists while Concord Hospital was represented by a nurse and pharmacist. There was no representation from Balmain Hospital.

WNSWLHD was represented by the Chronic Care Manager, who was responsible for the implementation of the Chart across the district. It is possible that the fact that the workshop was held centrally at ACI could have been a deterrent to having more representatives attend due to the cost involved. Having more workshops in more accessible locations could have increased attendance, which may have assisted in the implementation process.

ISLHD sent through 3 representatives. Their feedback was that further practical advice about implementing the Chart would have been welcome.

As the team from NSLHD involved in the roll out were unavailable for interview at the time of evaluation, no feedback was obtained.

Are participants still at the hospital and involved in Chart implementation?

Interviews: The clinical champions who were interviewed and attended the workshop had not changed workplaces since the workshop, apart from NSLHD.

What were the benefits of attending? How could the workshop have been improved?

Interviews: In terms of delivery and content, the workshop was generally well received, although ISLHD would have preferred stronger direction and guidance for implementation. It was noted that there would have been benefit in having more representation from each LHD. It was noted that in some cases, the nominated representatives attending did not always participate in the roll out and there may have been benefit in providing the LHDs with further guidance on who should attend, and the expectations of attendees.

Having a wider cross section of clinicians attend the workshop may have assisted in identifying the disconnect between rolling out a Chart designed to support best practice, in an environment that, outside of the specialist services, based on feedback and chart audits are aware of the need for daily prescribing and the use of supplemental insulin as opposed to sliding scale. The lack of awareness of the need for daily prescribing is considered by the evaluator, based on feedback from focus groups, to be the reason there seems to be overall a lack of a systematic approach to ensure daily prescribing on a timely basis for patients requiring subcutaneous insulin outside of specialist endocrinology units.

Project governance, project management plan and timeline (I)

Who is/was responsible for project governance? Is/was there a project manager?

Is there a documented project plan? If yes, does this have timeframes specified? Was the plan monitored or reviewed regularly? If so, by whom? Was the plan reasonable?

Interviews:

ACI provided support to the LHDs through providing a template of a project plan to support implementation. The project plans were populated by the LHDs and a copy sent to ACI. It is unclear if there were any specific mechanisms in place to formally update and report on progress of the implementation plan.
ACI provided copies of project plans the LHD provided to the ACI Endocrine Network Manager to the evaluator and these were noted to be variable in format and content. It was unclear which version utilised the ACI template. None were considered to be detailed in nature.

In each hospital there were project managers or clinical champions tasked with rolling out the Chart. RPA WNSWLHD and ISLHD advised of a formal project plan which involved a staged rollout over 3-6 months.

On review by the Evaluators these plans appear to be reasonable in terms of phases, roles and communication strategies. WNSWLHD and ISLHD had a Steering Committee (or the equivalent) to oversee the rollout which met routinely during the project. All LHDs had specialist endocrinologists supporting the roll out of the Chart. However it is unclear if all Medical Superintendants were heavily involved in the roll out. All feedback suggests that the focus on the roll out was implementing a new form.

There were no indications of a systemic approach to ensure all clinicians were aware of the best practice principles that the design of this form was intended to support. There was no suggestion of the development of any tools to support any change management required to support the underlying principles of the Chart – that is a systematic approach to ensure daily prescribing being achieved on a timely basis for all patients requiring subcutaneous insulin across the hospital/LHD.

The project manager of WNSWLHD thought that in retrospect he could have involved the Director of Nursing to a greater extent in order to reach out to the nursing educators who were key communicators about the Chart.

**Communication and motivational strategies (J), Community of interest (L), Education (M)**

*How were key stakeholders engaged as part of the Chart implementation process (e.g. potential users, Divisional/department managers, educators, hospital exec, LHD exec, quality & safety staff)? What did you do to promote the implementation of the Chart across your LHD/hospital (e.g. posters, newsletters)? How successful was this?*

**Interviews:** ACI engaged with LHD executive regarding the roll out of the Chart and invited a limited number of representatives to attend a workshop in Sydney.

The LHD Executive nominated representatives to be involved with, and have responsibility for implementation of the Chart. In SLHD the decision was made to have different teams responsible for the implementation at the different hospitals, and therefore the approach taken at each site seemed to vary. At RPA the lead was taken by the Endocrinology Staff Specialist supported by the Clinical Nurse Educator, following a suggestion from ACI that this person take the lead. At Canterbury Hospital the lead was taken by the Chief Pharmacist. Planning was conducted about how the chart would be rolled out and how users would be educated about the Chart, as outlined below.

At WNSWLHD and ISLHD, a formal implementation committee was instituted which included representation from various disciplines including medical officers, nurses and pharmacists who met on a regular basis to provide support and oversight of the implementation process.

Due to staff turnover the key clinicians with overall responsibility for implementation at NSLHD were not available. However the Endocrinologist at RNSH indicated that there was a multidisciplinary
team approach. The Endocrinologist was responsible for educating medical officers across the LHD. Clinical nurse educators were responsible for delivering training.

Generally there was a multi-modal approach to promoting the implementation of the Chart, including use of the poster, emails, newsletters, discussions and training. The training was considered most successful in promoting implementation, particularly where training was mandated as compulsory, which was mainly for nursing. For medical staff, the most successful approach taken seemed to be NSLHD where the leading Endocrinologist took whatever opportunity to engage with other groups of specialists, and delivered training about best practice which would be supported by the new form (the Chart).

**Was there a communication strategy?**

*Interviews:* The materials provided by ACI could have been used as part of a communications strategy however there were no tools provided by ACI to ensure the development and delivery of a consistent overarching communications strategy, which has been delivered as part of other ACI projects (i.e. the Medical Imaging District Services Implementation Toolkit).

A communication strategy was developed by the three LHDs as part of the implementation (NSLHD unable to be interviewed). News of the roll-out of the Chart was communicated to key senior managers to gain their support and buy in for educational activities to be provided to relevant clinicians. Posters were put up in some hospitals, although not all, as some interviewed expressed the view that there were now so many posters on so many various projects that they were not necessarily that useful. Emails were sent to medical officers – it was noted again that due to the heavy volume of email traffic that sometimes these types of emails tended to get overlooked with the various competing priorities.

At WNSWLHD, a mail-out was conducted to each facility including a starter pack of the Chart, posters, FAQs, and copies of the ACI CD with the supporting video to all site managers. There was some liaison with some of the senior nurses who provided clinical support to the smaller more remote facilities however it was noted that due to time constraints, these nurses had not managed to visit all sites prior to the Chart being implemented. It was suggested that this implementation could have been enhanced if these positions had been involved earlier in the process, as the opportunity to provide face to face communications regarding the implementation was considered valuable.

*What education was provided to support the implementation of the Chart? If so, who attended? How was this delivered? Are ongoing educational activities provided (e.g. at induction for new staff)? If so, what, who, how often? Are other educational activities provided about awareness and management of hyper/hypoglycaemia? If so, who, how often? Is education provided about reporting errors or adverse effects re insulin use? If so, who, how often?*

*Interviews:* Training for nurses was generally compulsory and was supported by in-service training and orientation training. There was less success in reaching out to medical officers with less formal training opportunities. Opportunities were made available however there was poor take up by medical officers since the training was not mandatory. Junior medical officers were considered to be time poor and conflicting clinical priorities could have contributed to poor attendance levels. There was particular poor take up by senior staff. Often nurses on the ward had to train doctors on how to use the Chart.
In WNSWLHD it was difficult to contact medical officers, as a large proportion of their medical workforce were VMOs who could be working in remote services. As the VMOs worked on a sessional basis, it was suggested that this group was more difficult to engage with when changes of clinical practice occurred. This was exacerbated by the fact that there was no buy-in from the Director of Medical Services, who was poorly motivated to sell this change to the workforce. Whilst the project plan for WNSWLHD implementation is quite specific regarding the approach to training nursing staff, there was less of a focus on the training of medical staff. The project plan mentioned emailing all clinical staff, and education forums including Clinical Councils, VMO meetings, Grand Rounds and JMO training however there were no specific details. It was unclear how much training was eventually delivered to medical staff.

In RPA, the medical training seemed to be quite thorough and was conducted through Grand Rounds, intern induction and 1 on 1 training, although as this was not mandatory, it was not necessarily well attended.

In NSLHD the Specialist Endocrinologist made herself widely available within the LHD, attending general rounds, medical team meetings for as many disciplines as would invite attendance, and any other relevant forum, using the opportunity to provide education about current best practice and also advise medical specialists about the introduction of the Chart to support this practice. Sometimes this could be for a few minutes up to over an hour. This approach was considered to be useful.

There were limited other educational activities about awareness and management of hyper/hyopglycaemia. Those hospitals/regions with specialist endocrinology units or Clinical Nurse Educators specialising in Diabetes were more likely to have educational activities available.

Not all sites have amended their induction training to incorporate the Chart. It was noted that there was only limited time at induction and there were already significant competing priorities including mandatory training. There were no other ongoing educational activities noted. There was no specific training regarding reporting errors or adverse effects re insulin use. However, it was noted that there was routine training provided about incident management reporting and the use of IIMS. Was a community of interest developed as a result? If so, who, how, when?
What ongoing communication activities have been used to motivate users to maintain interest?

Interviews: The motivation of users to adopt the Chart was low during the implementation. The Chart was seen as ‘another chart’ which was not relevant to the non-endocrine specialities. Buy-in may have been improved if the lack of awareness of best practice outside of specialist endocrinology services had been recognised and strategies implemented to address this – as users may have been more engaged if this was better understood. Communication to and buy-in of senior specialists and heads of departments could be improved. There was no specific ongoing communication activities used to motivate users to maintain interest. There was no clear evidence of a local community of interest being developed at an LHD level in any LHD.

**Distribution and availability (N)**

Who is/was responsible for distribution and ongoing availability of Charts?
How are Charts distributed? How is availability maintained?

Interviews: Availability of Charts was generally not an issue. The Charts were initially distributed across WNSWLHD by mail by the Chronic Care Manager and then site/ward managers (depending...
upon the size of the facility) are responsible for ensuring ongoing availability. At SLHD the various ward managers are responsible for ensuring ongoing availability. At NSLHD there was an issue of limited availability but this was an issue with the form provider and was quickly remedied.

Comment was received on the general visibility of the Chart from other charts – as an insulin chart it did not ‘stand out’ enough and was difficult to find. There was also a lack of appropriate indicators to direct users from the standard medication chart to the ACI Chart. Suggestions were made to attach the Chart to the back of the standard medication chart and to change the colour of the tab on the side of the Chart to improve visibility.

**Quality Assurance (O)**

*What ongoing monitoring or data collection activities are being undertaken in relation to the Chart in your LHD/hospital (e.g. audits, surveys)? Have you done chart audits using the ACI tool? If no, why not?*

**Interviews:** WNSWLHD, Canterbury Hospital and Concord Hospital provided evidence of quality assurance activities in the form of the ACI audits and surveys following the initial request for data from the evaluators. A high volume of feedback through these tools was received from WNSWLHD from a range of their sites.

Only 2 of the hospitals within the LHDs reviewed had undertaken the quality assurance activities prior to contact from the evaluators. There did not seem to be any understanding that these quality assurance activities were designed to provide the LHD with feedback regarding the uptake of the Chart including any potential issues.

*How have pharmacists been engaged in the monitoring/data collection process?*

**Interviews:** At Canterbury Hospital, pharmacists were involved in conducting the ACI audits. Pharmacists at RPA and WNSWLHD had not had any involvement in the monitoring/data collection process. Pharmacists at Hornsby had scheduled a review after the evaluators visit.

*Have you developed/adopted any data collection tools of your own? If yes, describe.*

**Interviews:** No new data collection tools or quality assurance activities were developed by LHDs.

**Usage of the Chart (P)**

*How many LHDs are now using the Chart? How many hospitals within each LHD are using the Chart?*

**Interviews:** The Chart was being used at Concord, Canterbury, RPA and has been distributed to all facilities (over 40) hospitals in WNSWLHD. All hospitals within NSLHD are using the Chart. All acute facilities within ISLHD are using the Chart. It was not clear that it was understood that facilities with sub-acute or long term residential beds could apply for exemptions to use the Chart.

**Outputs and Outcomes (Q, T)**

*Has the program and its educational activities resulted in relevant staff receiving training about Chart usage and management of hypo/hyperglycaemia?*

*Has the program and its educational activities resulted in satisfaction of staff with training received about insulin use and use of the Chart?*

**Electronic survey:** As shown in Table 1, only about half of doctors and nurses received training on the Chart. Up to 38% of respondents were very satisfied with the training they received, indicating significant room for improvement.
Table 1 Results of electronic survey – Percentage of respondents receiving training and those very satisfied with training

<table>
<thead>
<tr>
<th>Profession</th>
<th>% Receiving training</th>
<th>% Very satisfied with training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors</td>
<td>51%</td>
<td>21%</td>
</tr>
<tr>
<td>Nurses</td>
<td>54%</td>
<td>31%</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>64%</td>
<td>38%</td>
</tr>
</tbody>
</table>

Has the program and its educational activities resulted in improved awareness and knowledge of staff in managing patients with diabetes on S/C insulin?

**Electronic survey:** 24% of respondents reported that the Chart improved their knowledge and awareness of managing patients with diabetes. 60% of respondents received training on how to manage hypoglycaemia and hyperglycaemia.

**Figure 6 Results of the electronic survey: “Has the Chart improved your knowledge and awareness of managing patients with diabetes?”**

Has the program and its educational activities resulted in high proportion of compliance with Chart usage across wards in hospitals and across hospitals in LHDs for eligible patients?

**Audits:** 88% of diabetic patient on insulin were using the Chart.

Has the program and its educational activities resulted in high proportion of charts completed correctly and consistently? What proportion of charts were adequately completed over each episode of care?

**Audits:** 25% of Charts were completed correctly as per the Guidelines.

It was suggested as part of the interviews that the limited space available for recording was resulting in charts not being completed correctly.

The audit did not include any data on whether the incorrectly completed charts had errors that could result in clinically significant errors. This should be considered for inclusion as part of the summative evaluation.

Has the program and its educational activities resulted in high proportion of staff satisfied with usability of chart?
**Paper survey:** When medical staff were asked how easy or difficult it was to prescribe regular or supplemental insulin using the Chart, their average response was ‘not sure’. Nursing staff thought that it was difficult to administer insulin with the Chart and were unsure about the administration of supplemental insulin.

**Electronic survey:** Most doctors (69%) agreed with the statement that when thinking about prescribing regular subcutaneous insulin, the Chart was more difficult than using other medication charts. About half of doctors agreed with the statement that when thinking about prescribing supplemental insulin, the Chart was more difficult than using other medication charts (Figure 7).

**Figure 7** Results of the electronic survey in relation to the views of doctors about the difficulty of using the Chart to prescribe regular/supplemental subcutaneous compared to other medication charts

Most nurses agreed with the statement that when thinking about the administration of subcutaneous insulin, that the Chart was more difficult to use than other medication charts for both regular and supplemental insulin administration (Figure 8).

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4 Possible responses were: ‘Very Difficult’, ‘Difficult’, ‘Not sure’, ‘Easy’, ‘Very easy’
Most pharmacists agreed with the statement that when thinking about the dispensing of subcutaneous insulin that the Chart was more difficult to use than other medication charts for supplemental insulin (Figure 9).

Has the program and its educational activities resulted in improved awareness of clinical staff about the importance of identifying and reporting insulin prescribing errors and adverse events?

Electronic survey: About a third of respondents reported that the Chart improved their awareness about the importance of identifying and reporting insulin prescribing errors and adverse events, as shown in Figure 10.
Figure 10 Results of the electronic survey: “Has the Chart improved your awareness about the importance of identifying and reporting insulin prescribing errors and adverse events?”

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>31%</td>
<td>52%</td>
<td>17%</td>
</tr>
</tbody>
</table>

Has the program and its educational activities resulted in improved recognition of errors in S/C insulin prescribing?

Electronic survey: Figure 11 shows that approximately half of respondents thought the Chart had not improved the recognition of errors in insulin prescribing.

Figure 11 Results of the electronic survey: “Has the Chart improved your recognition of errors in subcutaneous insulin prescribing?”

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>31%</td>
<td>53%</td>
<td>16%</td>
</tr>
</tbody>
</table>

How useful have you found the Chart guidelines?

Interviews: While some users found the Chart guidelines useful, some thought it was not needed and was “a waste of space”. In Orange Hospital there was some conflict with the hospital’s recently released guidelines which had different blood glucose level (BGL) thresholds. It was unclear that the Chart guidelines were only supposed to be used in the absence of other local guidelines, and where local guidelines had been adopted, that the local guidelines took precedence.
What gaps remain in knowledge about managing patients with diabetes on S/C insulin?

Interviews: The Supplemental Order section often seemed to be used inappropriately for Sliding Scale Insulin. An example of this is shown in Figure 21 where there is the absence of regular insulin prescribing. Education is needed for doctors and nurses to clarify the use of this section.

Daily prescribing I

What proportion of patients with diabetes receives daily prescribing appropriately?
Is it clear to staff under what circumstances a person would require/receive daily prescribing?

Audits: 77% (126/164) of episode audits reported daily prescribing.

Interviews: Positive feedback of the Chart was received regarding BGLs being on the same chart as prescribing information and the promotion of basal-bolus prescribing. There was also negative feedback relating to the space available to write on the Chart.

“The only beneficial aspect of the chart is the sliding scale section which makes it easier to chart supplemental insulin rather than having to write it by hand.”
However, throughout the consultations it was heard that daily prescribing was not occurring routinely, resulting in missed or delayed doses, especially in the morning. This was attributed to low familiarity with the chart, inadequate education and the need for a change in work practices. Often nurses found that the home team had only prescribed for the current day, which left the overnight covering medical officer to write up the next day’s dose. The covering medical officer often did not have time to do this and when they did they were not confident to prescribe a whole day’s medication. Nurses emphasised that doctors need more education in this area to prevent missed doses occurring.

This suggests that there is a view held by clinicians that daily prescribing means prescribing for a specific day. Changing the clinical understanding to one of daily prescribing being prescribing for a 24 period may result in a reduction in the number of missed morning doses, if clinicians can prescribe from either pre-lunch or pre-dinner for the next 24 hour period. Ideally this should fit with ward rounds/prescriber availability.

In rural areas, daily charting to prescribe subcutaneous is practically not possible because doctors are offsite and so nursing staff often had to use the telephone order section. These nurses requested extra space for telephone orders because the current box only contained a few lines.

To assist daily prescribing of subcutaneous insulin, it was suggested that the Chart should also include oral hypoglycaemic drugs.

Some staff were not aware of the option available for stable diabetic patients to self-administer their insulin, and document accordingly using the Chart.

**Daily monitoring (S)**

*What proportion of charts showed daily monitoring of blood glucose?*

**Audits:** 94% of Charts had daily monitoring of blood glucose

*What proportion of charts showed daily monitoring of ketones?*

**Audits:** Almost all Charts (96%) did not have daily ketone monitoring. It is noted that this option is only required for patients with Type 1 diabetes who need testing, however the Instructions section of the Chart indicates that all patients receiving subcutaneous insulin should have their ketones recorded. The audits showed that patients with diabetic ketoacidosis did not have ketone monitoring recorded on the Chart, as a different chart was used.

**What are the barriers to daily monitoring occurring?**

**Interviews:** Nurses reported that they were quite diligent in recording blood glucose levels on the Chart.

Interviewee suggestions for improvement included:

- bigger boxes for easier readability and recording
- the ability to graph BSLs
- locating BGLs adjacent to the doses to assist with prescribing.
A few nurses thought the Hypoglycaemia Treatment Record Area was a waste of space and may even increase the risk of double dosing of patients.

Feedback was received that the Chart did not allow BGL monitoring more frequently than the boxes provided (14 times a day) and there were some instances when hourly monitoring was required.

The monitoring of ketones was rarely done mainly because users believed that it was not indicated. Some wards had a lack of equipment to monitor ketones.

**Glycaemic control (U)**

*Has use of the Chart been helpful in achieving better glycaemic control for patients, when compared to previous medication charts?*

Electronic survey: When respondents were asked if the Chart promotes better glycaemic control of patients with diabetes, a third of respondents thought it did promote better glycaemic control while two thirds of respondents thought it didn’t or were not sure (Figure 13).

**Figure 13** Results of the electronic survey to: “Do you think the Chart promotes better glycaemic control of patients with diabetes compared to previous insulin charts?”

A similar response was received when participants were asked if the Chart was an improvement on previous charts – over two thirds of respondents (68%) did not think it was, or were unsure, as shown in Figure 14.
Figure 14 Results of the electronic survey to: “Overall is the adult subcutaneous insulin prescribing chart an improvement on the charts you have previously used?”

Paper survey: Overall, doctors and pharmacists thought the Chart was an improvement over previous charts, however nurses thought it wasn’t an improvement.

Specifically, has the daily monitoring of blood glucose and of ketones improved glycaemic control for patients?
Paper survey: Doctors and pharmacists thought that blood glucose monitoring was useful, while nurses were unsure of its benefit. For ketones monitoring, doctors and nurses were unsure of its benefit in the chart.

Electronic survey: Most doctors and nurses agreed that BGLs on the Chart made prescribing and administration of insulin easier as shown in Figure 15 and Figure 16. There was less agreement for ketones.

Figure 15 Results of the electronic survey in relation to BGL and ketones making prescribing of insulin easier for doctors
Figure 16 Results of the electronic survey in relation to BGL and ketones making the administration of insulin easier for nurses

Chart audit
50 charts were specifically reviewed to determine if supplemental insulin had been written up, and when BGLs fell outside a specific range, if a corresponding action had been recorded:

- Only 20 of 50 charts reviewed had supplemental orders written up
- 14 of the 50 charts reviewed had a corresponding action recorded taken when BGL fell below 4 mmol/L, above 10 mmol/L in the absence of alternating supplemental orders, or when supplemental orders were written, above the indicated BGL range for intervention
- 3 of the 50 charts reviewed had one or more instances of BGL falling below 4 mmol/L but no corresponding action recorded on the Chart. It may have been that actions were undertaken and recorded elsewhere on the medical record as only the Chart was reviewed as part of this evaluation
- 33 of the 50 charts reviewed had at least one instance of the BGL being above either:
  o 10 mmol/L in the absence of supplemental insulin ranges being specified; or
  o where supplemental insulin ranges were specified, being above that specified range and no corresponding action had been recorded.

Adverse events or errors (V, X)
Has there been an increase/decrease in reporting of adverse events, prescribing errors or administration errors? How many events/errors have been reported? What is the proportion of events/errors involving S/C insulin (compared to all medication errors reported) – pre implementation, post implementation?

IIMS data: As shown in Figure 16, there was increase in the IIMS incidents post-implementation of the Chart, by at least twice the pre-implementation amount. The Severity Assessment Codes of these were 3 (medium risk) and 4 (low risk). The dates of the IIMS data received from LHDs are presented in Table 1.
In May 2014 there were a total of 16 insulin-related incidents in SLHD of which 6 incidents were attributed to the Chart. In comparison, there were 5 insulin-related incidents in May 2013. The Chart incidents involved insulin not being administered as charted. Five of these incidents originated from Concord Hospital in various wards – Thoracic Unit, Urology/Breast, Burns Unit and Oncology/Haematology/Palliative. Unfamiliarity with the Chart was a reason given for 2 of the incidents. Total (non-insulin related) incidents were not provided and so it was not possible to calculate the proportion of insulin-related incidents.

In June 2013, 3 WNSWLHD incidents relating to insulin were recorded, which increased to 10 incidents in June 2014. One of the incidents in June 2014 which involved a missed administration dose made mention of a ‘new medication chart’ and ‘difficult to read small print orders’ as contributing factors. It is likely that this incident relates to the ACI Chart. It is not known if the other 9 incidents were related to the Chart. As a proportion of total incidents, insulin-related errors increased from 3.3% to 7.0%.

The chart can be confusing to read, and doses of insulin can easily be missed.

In November 2013, 4 NSLHD incidents relating to insulin were recorded, which increased to 8 incidents in November 2014. One of the incidents in November 2014 which involved a missed administration dose made mention of a ‘new medication chart’ and ‘difficult to read small print orders’ as contributing factors. It is likely that this incident relates to the ACI Chart. It is not known if the other 4 incidents were related to the Chart. As a proportion of total incidents, insulin-related errors increased from 3.3% to 7.0%.

In July 2013, 4 ISLHD incidents relating to insulin were recorded, which increased to 13 incidents in July 2014. One of the incidents in July 2014 which involved a missed administration dose made mention of a ‘new medication chart’ and ‘difficult to read small print orders’ as contributing factors. It is likely that this incident relates to the ACI Chart. It is not known if the other 9 incidents were related to the Chart. As a proportion of total incidents, insulin-related errors increased from 3.3% to 7.0%.
Of the 8 incidents that occurred in November 2014 in NSLHD, 3 incidents appeared to be related to the Chart. They involved missed prescribing doses and incorrect dosage administration. Incidents occurred in surgical, cardiothoracic and psychogeriatric wards.

**ISLHD IIMS**
In ISLHD, 6 of the 13 incidents in July 2014 appeared to be related to the Chart. They involved missed administration doses and missed/delayed prescribing doses. Incidents occurred in both Wollongong Hospital and Shoalhaven District Memorial Hospital. One of the incident descriptions stated ‘New subcutaneous insulin chart misread’ which resulted in the pre-breakfast dose of one of the insulins being missed.

The increased number of insulin-related IIMS incidents post implementation of the Chart appears to be driven, in part, by the deficiencies of the Chart and has low to medium-risk safety implications.

**Consistent approach to prescribing and administering (W)**

*Has a consistent approach to prescribing and administering S/C insulin been demonstrated by all staff?*

Interviews: The administration of insulin appeared to be more consistent than prescribing for the reasons given in section R above. Even then, nurses complained of the Chart being too busy, difficult to read (because of the small size of boxes) and not intuitive. Examples of busy charts are shown in Figure 19 and Figure 20. Most preferred a chart with the same layout as the NMC where drugs ran vertically and days ran horizontally.

Some Chart users queried if the prescriber who wrote the initial order was legally required to sign for the subsequent daily doses.

Audits: Mentioned above in element Q.
### Table 3 Evaluation questions

<table>
<thead>
<tr>
<th>Code</th>
<th>Evaluation Questions</th>
<th>Data source</th>
</tr>
</thead>
</table>
| A    | • What is the trigger for the Chart to be utilised for a patient (i.e. how are patients identified as appropriate for the Chart)?  
• Who decides? When do they decide?  
• How is the Chart implemented for patients who present via ED?  
• Does the preadmission process identify booked patients who will require S/C insulin during their hospital stay? | Interview/Focus Group (I/FG)  
I/FG  
I/FG  
I/FG |
| B    | • What staff resources were allocated to assist with implementation and the chart/project management?  
• Are any resources allocated ongoing? If so what? | I/FG  
I/FG |
| C    | • Are there any local data collection systems that are relevant or useful to the Chart? If so, what?  
• What other systems exist that potentially conflict with Chart implementation? | I/FG  
I/FG |
| D    | • Is there any executive sponsor of this project?  
• If so, who are they? What is their involvement? | Pre Site Visit Questionnaire (PSVQ)  
PSVQ  
I/FG |
| E    | • Does the hospital/LHD have a specialist Endocrinology service? If so, what services are provided and on what basis (f/t, p/t, sessional)?  
If not, what services/supports are available to clinicians treating people with diabetes? | PSVQ  
PSVQ  
PSVQ |
| F    | • Was the hospital a participant in the pilot? | PSVQ |
| G    | • What training resources were available at time of implementation?  
• Were any extra resources provided for this project (e.g. staff, funding/in-kind support)? | I/FG  
I/FG |
| H    | • Who from the LHD/Hospital attended the ACI implementation workshop? Are participants still at the hospital and involved in Chart implementation?  
• What were the benefits of attending? How could the workshop have been improved? | ACI  
I/FG  
I/FG |
| I    | • Who is/was responsible for project governance?  
• Is/was there a project manager?  
• Is there a documented project plan? If yes, does this have time frames specified? Was the plan monitored or reviewed regularly? If so, by whom?  
• Was the plan reasonable? | PSVQ  
PSVQ  
PSVQ  
I/FG  
I/FG |
| J    | • Was there a communication strategy?  
• What did you do to promote the implementation of the Chart across your LHD/hospital (e.g. posters, newsletters)? How successful was this?  
• What ongoing communication activities have been used to motivate users to maintain interest? | PSVQ  
I/FG  
I/FG |
| K    | • Is/was there a clinical champion? If so, how were they identified and engaged?  
What was their role? | PSVQ |
| L    | • How were key stakeholders engaged as part of the Chart implementation process (e.g. potential users, Divisional/department managers, educators, hospital exec, LHD exec, quality & safety staff)?  
• Was a community of interest developed as a result? If so, who, how, when? | I/FG  
PSVQ & I/FG |
| M    | • What education was provided to support the implementation of the Chart? If so, who attended? How was this delivered?  
• Are ongoing educational activities provided (e.g. at induction for new staff)? If so, what, who, how often? | I/FG  
I/FG |
<table>
<thead>
<tr>
<th>Code</th>
<th>Evaluation Questions</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Are other educational activities provided about awareness and management of hyper/hypoglycaemia? If so, who, how often?</td>
<td>I/FG</td>
</tr>
<tr>
<td>N</td>
<td>Is education provided about reporting errors or adverse effects re insulin use? If so, who, how often?</td>
<td>I/FG</td>
</tr>
<tr>
<td>N</td>
<td>Who is/was responsible for distribution and ongoing availability of Charts?</td>
<td>PSVQ</td>
</tr>
<tr>
<td>N</td>
<td>How are Charts distributed? How is availability maintained?</td>
<td>PSVQ</td>
</tr>
<tr>
<td>O</td>
<td>What ongoing monitoring or data collection activities are being undertaken in relation to the Chart in your LHD/hospital (e.g. audits, surveys)?</td>
<td>I/FG</td>
</tr>
<tr>
<td>O</td>
<td>Have you done chart audits using the ACI tool? If no, why not? If yes, what were the results? How have pharmacists been engaged in the monitoring/data collection process?</td>
<td>I/FG</td>
</tr>
<tr>
<td>O</td>
<td>Have you developed/adopted any data collection tools of your own? If yes, describe.</td>
<td>I/FG</td>
</tr>
<tr>
<td>O</td>
<td>Have any QI activities been conducted re the Chart?</td>
<td>I/FG</td>
</tr>
<tr>
<td>P</td>
<td>How many LHDs are now using the Chart?</td>
<td>PSVQ</td>
</tr>
<tr>
<td>P</td>
<td>How many hospitals with each LHD are using the Chart?</td>
<td>PSVQ</td>
</tr>
<tr>
<td>Q</td>
<td>Has the program and its educational activities resulted in:</td>
<td>Survey</td>
</tr>
<tr>
<td>Q</td>
<td>- relevant staff receiving training about Chart usage and management of hypo/hyperglycaemia?</td>
<td>Survey</td>
</tr>
<tr>
<td>Q</td>
<td>- satisfaction of staff with training received about insulin use and use of the Chart?</td>
<td>Survey</td>
</tr>
<tr>
<td>Q</td>
<td>- improved awareness and knowledge of staff in managing patients with diabetes on S/C insulin?</td>
<td>Survey</td>
</tr>
<tr>
<td>Q</td>
<td>- high proportion of compliance with Chart usage across wards in hospitals and across hospitals in LHDs for eligible patients?</td>
<td>Audit</td>
</tr>
<tr>
<td>Q</td>
<td>- high proportion of charts completed correctly and consistently?</td>
<td>Audit</td>
</tr>
<tr>
<td>Q</td>
<td>- high proportion of staff satisfied with usability of chart?</td>
<td>Survey</td>
</tr>
<tr>
<td>Q</td>
<td>- improved awareness of clinical staff about the importance of identifying and reporting insulin prescribing errors and adverse events?</td>
<td>Survey</td>
</tr>
<tr>
<td>Q</td>
<td>- improved recognition of errors in S/C insulin prescribing?</td>
<td>I/FG, Survey</td>
</tr>
<tr>
<td>Q</td>
<td>How useful have you found the Chart guidelines?</td>
<td>I/FG</td>
</tr>
<tr>
<td>Q</td>
<td>What gaps remain in knowledge about managing patients with diabetes on S/C insulin?</td>
<td>I/FG</td>
</tr>
<tr>
<td>R</td>
<td>Is it clear to staff under what circumstances a person would require/receive daily prescribing?</td>
<td>I/FG</td>
</tr>
<tr>
<td>R</td>
<td>What proportion of patients with diabetes receive daily prescribing appropriately?</td>
<td>Audit</td>
</tr>
<tr>
<td>S</td>
<td>What proportion of charts showed daily monitoring of blood glucose?</td>
<td>Audit</td>
</tr>
<tr>
<td>S</td>
<td>What proportion of charts showed daily monitoring of ketones?</td>
<td>Audit</td>
</tr>
<tr>
<td>S</td>
<td>What are the barriers to daily monitoring occurring?</td>
<td>I/FG</td>
</tr>
<tr>
<td>T</td>
<td>What proportion of charts were adequately completed over each episode of care?</td>
<td>Audit</td>
</tr>
<tr>
<td>U</td>
<td>Has use of the Chart been helpful in achieving better glycaemic control for patients, when compared to previous medication charts?</td>
<td>Survey</td>
</tr>
<tr>
<td>U</td>
<td>Specifically, has the daily monitoring of blood glucose and of ketones improved glycaemic control for patients</td>
<td>Audit &amp; I/FG</td>
</tr>
<tr>
<td>V</td>
<td>Has there been an increase in reporting of adverse events?</td>
<td>IIMS data</td>
</tr>
<tr>
<td>V</td>
<td>How many medication errors have been reported? What is the number of errors involving S/C insulin (compared to all medication errors reported)?</td>
<td>IIMS data</td>
</tr>
<tr>
<td>V</td>
<td>o pre implementation</td>
<td>IIMS data</td>
</tr>
<tr>
<td>V</td>
<td>o post implementation</td>
<td>IIMS data</td>
</tr>
<tr>
<td>V</td>
<td>What is the number of adverse events involving S/C insulin (compared to all IIMS data)</td>
<td>IIMS data (to be determined)</td>
</tr>
<tr>
<td>Code</td>
<td>Evaluation Questions</td>
<td>Data source</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>W</td>
<td>• Has a consistent approach to prescribing and administering S/C insulin been demonstrated by all staff?</td>
<td>I/FG &amp; Audit</td>
</tr>
<tr>
<td>X</td>
<td>• Has there been a reduction in S/C insulin prescribing and administration errors following Chart implementation?</td>
<td>IIMS data</td>
</tr>
<tr>
<td></td>
<td>• Has there been a reduction in adverse events related to S/C insulin following Chart implementation?</td>
<td>IIMS data</td>
</tr>
</tbody>
</table>
Appendix C  User Survey – Paper-based

SUBCUTANEOUS INSULIN PRESCRIBING CHART PILOT: USER SURVEY

The Agency for Clinical Innovation (ACI) Endocrine Network is currently evaluating the NSW Subcutaneous Insulin Prescribing Chart and your input would be greatly appreciated. Your feedback and suggestions will assist the ACI Endocrine Network in the ongoing evaluation of the chart and in improving the management of people with diabetes in hospital.

Please place your completed survey in the nominated box for the ACI Endocrine Network Manager’s collection.

1. Please describe your profession
   - Nursing
   - Medical
   - Pharmacy

2. On a scale of 1 to 5, 1 being the least useful and 5 being the most useful, please indicate how you found the instructions for using the Subcutaneous Insulin Prescribing Chart (page 1).
   - N/A
   - 1
   - 2
   - 3
   - 4
   - 5

   Least Useful
   Not very Useful
   Not Sure
   Useful
   Really Useful

3. On a scale of 1 to 5, 1 being the least useful and 5 being the most useful, please indicate how useful the guidelines for the use of the supplemental insulin were (page 4).
   - N/A
   - 1
   - 2
   - 3
   - 4
   - 5

   Least Useful
   Not very Useful
   Not Sure
   Useful
   Really Useful

4. On a scale of 1 to 5, 1 being the very difficult and 5 being the very easy, please indicate how prescribing insulin using the subcutaneous insulin chart was.
   - N/A
   - 1
   - 2
   - 3
   - 4
   - 5

   Very Difficult
   Not Sure
   Easy
   Very Easy

5. On a scale of 1 to 5, 1 being the very difficult and 5 being the very easy, please indicate how administering insulin using the subcutaneous insulin chart was.
   - N/A
   - 1
   - 2
   - 3
   - 4
   - 5

   Very Difficult
   Not Sure
   Easy
   Very Easy
6. On a scale of 1 to 5, 1 being the very difficult and 5 being the very easy, please indicate how prescribing supplemental insulin using the subcutaneous insulin chart was.

☐ N/A

1 2 3 4 5
Very Difficult Not Sure Easy Very Easy

7. On a scale of 1 to 5, 1 being the very difficult and 5 being the very easy, please indicate how administering supplemental insulin using the subcutaneous insulin chart was.

☐ N/A

1 2 3 4 5
Very Difficult Not Sure Easy Very Easy

8. On a scale of 1 to 5, 1 being the least useful and 5 being the most useful, please indicate how having the blood glucose monitoring on the subcutaneous insulin chart is.

☐ N/A

1 2 3 4 5
Least Not very Not Sure Useful Really
Useful Useful

9. On a scale of 1 to 5, 1 being the least useful and 5 being the most useful, please indicate how having the ketone monitoring on the subcutaneous insulin chart was.

☐ N/A

1 2 3 4 5
Least Not very Not Sure Useful Really
Useful Useful

10. Overall is the adult subcutaneous insulin prescribing chart an improvement on the charts you have previously used

☐ Yes ☑ No

Please provide any comments that would assist the ACI Endocrine Network to improve the chart and its usability:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Appendix D  User Survey – Electronic
Introduction

The aim of this survey is to seek your views to inform the evaluation of the NSW Subcutaneous Insulin Prescribing Chart (the Chart).

Your feedback will help guide us to improve the systems and processes utilised to implement and ongoing monitoring of the Chart.

This survey has been designed to be completed by a range of professional groups - medical officers, nurses and pharmacists. All individual survey responses will be treated as confidential. In any presentation or publication information will be provided in a de-identified way so the individual and/or the organisation you represent will not be identified.

This survey is likely to take no more than 5-10 minutes of your time.

Thank you for your participation in this process.

* 1. Please select the LHD where you work:

* 2. Your profession

- Medical
- Nursing
- Pharmacy

Medical Officers

3. Have you used the Subcutaneous Insulin Prescribing Chart for prescribing regular subcutaneous insulin to patients?

- Yes, a couple of times
- Yes, many times
- No

4. Thinking about using the Chart to prescribe regular subcutaneous insulin, please indicate your response to the following statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Chart was easy to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was confusing to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was more difficult than using other medication charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Have you used the Chart to prescribe supplemental insulin to patients - that is additional to the patient’s usual diabetes treatment and includes once only and telephone orders?
- Yes, a couple times
- Yes, many times
- No

6. Thinking about using the Chart to prescribe supplemental subcutaneous insulin, please indicate your response to the following statements

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Chart was easy to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was confusing to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was more difficult than using other medication charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Having the blood glucose monitoring on the Chart makes it easier when prescribing insulin:
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
- Have not used

8. Having the ketone monitoring on the Chart makes it easier when prescribing insulin:
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
- Have not used
9. Have you used the Subcutaneous Insulin Prescribing Chart for administering regular subcutaneous insulin to patients?
- Yes, a couple of times
- Yes, many times
- No

**Nursing**

10. Thinking about using the Chart to administer regular subcutaneous insulin, please indicate your response to the following statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Chart was easy to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was confusing to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was more difficult than using other medication charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Have you used the Chart to administer supplemental insulin to patients - that is additional to the patient's usual diabetes treatment and includes once only and telephone orders?
- Yes, a couple times
- Yes, many times
- No

12. Thinking about using the Chart to administer supplemental subcutaneous insulin, please indicate your response to the following statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Chart was easy to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was confusing to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was more difficult than using other medication charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. Having the blood glucose monitoring on the Chart makes it easier when administering insulin:
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
- Have not used

14. Having the ketone monitoring on the Chart makes it easier when administering insulin:
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
- Have not used

Pharmacists

15. Have you used the Subcutaneous Insulin Prescribing Chart for dispensing regular subcutaneous insulin to patients?
- Yes, a couple of times
- Yes, many times
- No

Pharmacists

16. Thinking about using the Chart to dispense regular subcutaneous insulin, please indicate your response to the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Chart was easy to use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was confusing to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Chart was more difficult than using other medication charts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
17. Have you used the Chart to dispense supplemental insulin to patients - that is additional to the patient's usual diabetes treatment and includes once only and telephone orders?
   - Yes, a couple times
   - Yes, many times
   - No

18. Thinking about using the Chart to dispense supplemental subcutaneous insulin, please indicate your response to the following statements
   - The Chart was easy to use
   - The Chart was confusing to me
   - The Chart was more difficult than using other medication charts

19. Having the blood glucose monitoring on the Chart makes it easier when dispensing insulin:
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree
   - Have not used

20. Having the ketone monitoring on the Chart makes it easier when dispensing insulin:
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree
   - Have not used

Using the Chart

21. Have you read the general instructions for using the Chart (on page 1)?
   - Yes
   - No
22. How helpful did you find the general instructions?
- Very helpful
- Somewhat helpful
- Not helpful or unhelpful
- Somewhat unhelpful
- Very unhelpful

23. How easy or difficult were the general instructions to understand?
- Very easy
- Somewhat easy
- Not easy or difficult
- Somewhat difficult
- Very difficult

24. Have you read the guidelines for using supplemental insulin (on page 4)?
- Yes
- No

25. What was your reason for not reading the guidelines on supplemental insulin?
- Did not see the guidelines
- Chart was self-explanatory
- Other

26. How helpful did you find the guidelines on supplemental insulin?
- Very helpful
- Somewhat helpful
- Not helpful or unhelpful
- Somewhat unhelpful
- Very unhelpful
27. How easy or difficult were the guidelines on supplemental insulin to understand?
- Very easy
- Somewhat easy
- Not easy or difficult
- Somewhat difficult
- Very difficult

28. Did you receive training on the Chart?
- Yes
- No

29. How satisfied were you with the training provided about the Chart?
- Very satisfied
- Somewhat satisfied
- Not satisfied or dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

30. Did you receive training on how to manage hypoglycaemia and hyperglycaemia?
- Yes
- No

31. How satisfied were you with the training on hypo/hyperglycaemia?
- Very satisfied
- Somewhat satisfied
- Not satisfied or dissatisfied
- Somewhat dissatisfied
- Very dissatisfied
32. Has the Chart improved your knowledge and awareness of managing patients with diabetes?
   - Yes
   - No
   - Not sure

33. Has the Chart improved your awareness about the importance of identifying and reporting insulin prescribing errors and adverse events?
   - Yes
   - No
   - Not sure

34. Has the Chart improved your recognition of errors in subcutaneous insulin prescribing?
   - Yes
   - No
   - Not sure

35. Do you think the Chart promotes better glycaemic control of patients with diabetes compared to previous insulin charts?
   - Yes
   - No
   - Not sure

36. Overall is the adult subcutaneous insulin prescribing chart an improvement on the charts you have previously used?
   - Yes
   - No
   - Unsure
37. Please provide any comments that would assist the ACI Endocrine Network to improve the chart and its usability:

Thank you

Thank you for your feedback. Your participation is appreciated.
Appendix E  Chart Audit Information Sheet

Introduction
The NSW Agency for Clinical Innovation has launched a new Subcutaneous Insulin Prescribing Chart in your hospital which aims to reduce insulin prescribing and administration errors, improve consistency of prescribing and administration, and achieve better glycaemic control of adult patients with diabetes on insulin.

An audit of the Chart is necessary to assist the evaluation of the effectiveness and implementation of the Chart. Your assistance with gathering audit information is appreciated so that safer and better patient care can be provided.

Methodology
It is necessary to gauge the extent of adoption of the Chart across the hospital and to determine compliance with the Chart guidelines.

An Episode Audit provides retrospective data relating to an entire admission. The ‘Comments’ column in the forms is optional and allows the auditor to record information of interest that may be useful for improvement of the Chart.

A minimum of 15 Episode Audits (in each hospital) of random patients with diabetes taking insulin need to be completed. A suggested approach to obtain a random sample is to obtain an alphabetical list of patients since introduction of the Chart from Medical Records, who had the following primary or secondary diagnoses:

- Type 1 diabetes mellitus with poor control
- Type 2 diabetes mellitus with poor control
- Type 1 diabetes mellitus with hypoglycaemia
- Type 2 diabetes mellitus with hypoglycaemia
- Elevated blood glucose level
- Impaired glucose regulation
- Insulin treated type 1 diabetes mellitus in pregnancy
- Insulin treated type 2 diabetes mellitus in pregnancy

Following this, select every nth (e.g. 5th) patient in the list to be audited.

Once the forms are completed, please send them to ACI (attn. Rebecca Donovan).

Confidentiality
Patient identifying data is not recorded on the form – only general clinical information and information relating to chart usage is recorded.

Further information
For questions or comments on the Audit Form or process, please contact:

Rebecca Donovan
Endocrine Network Manager
Agency for Clinical Innovation
(02) 9464 4626
### Appendix F  Chart Audit Tool

**Figure 18 Chart Audit Form for an episode**

<table>
<thead>
<tr>
<th>No.</th>
<th>Audit question</th>
<th>Result</th>
<th>Comments (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does this patient have diabetes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Is this patient taking insulin?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Is this patient using the ACI Subcutaneous Insulin Prescribing Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Why was this patient admitted? <em>(state principal diagnosis or symptom if undiagnosed)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Has this chart been completed correctly, as per the guidelines throughout the episode of care? <em>(If yes, skip to Q14)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Has the ‘regular insulin’ prescribing section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Has the ‘regular insulin’ administration section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Has the ‘supplemental order’ prescribing section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Has the ‘supplemental order’ administration section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Has the ‘once only order’ prescribing section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Has the ‘once only order’ administration section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Has the ‘telephone order’ prescribing section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Has the ‘telephone order’ administration section been completed correctly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Has insulin been prescribed daily?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Has insulin been administered daily?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Has there been daily monitoring of blood glucose on the Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Has there been daily monitoring of ketones on the Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>How many times was the BGL &lt; 4 mmol/L?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>How many times was the BGL ≥ 10 mmol/L?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix G  Sample Charts

Figure 19 Sample Chart 1
Figure 20 Sample Chart 2
### REGULAR SUBCUTANEOUS INSULIN

<table>
<thead>
<tr>
<th>Type of Insulin</th>
<th>Frequency</th>
<th>Type of Insulin</th>
<th>Frequency</th>
<th>Type of Insulin</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td>Prescriber (Print name)</td>
<td>Contact</td>
<td>Signature</td>
<td>Prescriber (Print name)</td>
<td>Contact</td>
</tr>
<tr>
<td>Date</td>
<td>Pharmacy</td>
<td>Date</td>
<td>Pharmacy</td>
<td>Date</td>
<td>Pharmacy</td>
</tr>
</tbody>
</table>

#### SUPPLEMENTAL ORDER

To be used in addition to patient's usual diabetes treatment. See guidelines.

---

**Record of Administration**

<table>
<thead>
<tr>
<th>Date</th>
<th>Drug given</th>
<th>Time given by</th>
<th>Drug given</th>
<th>Time given by</th>
<th>Drug given</th>
<th>Time given by</th>
<th>Drug given</th>
<th>Time given by</th>
<th>Drug given</th>
<th>Time given by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4/6</td>
<td></td>
<td></td>
<td>1/5/6</td>
<td></td>
<td>1/6/6</td>
<td></td>
<td>1/7/6</td>
<td></td>
<td>1/8/6</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>3</td>
<td></td>
<td>4</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

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**ACI – Evaluation of the Subcutaneous Insulin Prescribing Chart in Two LHDs**
### Table 4 Interview Guide - LHD/Hospital Exec

<table>
<thead>
<tr>
<th>Domain Area</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>O’Connell Advisory has been engaged by ACI to assist in the evaluation of the Subcutaneous Insulin Prescribing Chart. The purpose for this interview is to obtain feedback on the Chart since its introduction in your LHD. This will inform the development of the Evaluation Plan and Tools which will support ACI to implement the Chart throughout the state.</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td>Has a consistent approach to prescribing and administering S/C insulin been demonstrated by all staff?</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td>Overarching question/topic – Please tell us about how the implementation of the Chart has worked in your LHD/hospital? Are you aware if anyone from the LHD/Hospital attended the ACI implementation workshop? If so, what were the benefits of attending? How could the workshop have been improved? Are the participants still with the LHD/Hospital? Are they still involved in the Chart implementation? Did the LHD develop a project plan to implement the Subcutaneous Insulin Chart? If so was the project plan reasonable in terms of timeframe and tasks? Could it have been improved? What did the LHD do to promote the implementation of the Chart across your LHD/hospital (e.g. posters, newsletters)? How successful was this? Could this have been improved? What ongoing communication activities have been used to motivate users to maintain interest?</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td>Overarching question/topic – In relation to the chart - is there any monitoring taking place? Are you aware of ongoing monitoring or data collection activities are being undertaken in relation to the Chart in your LHD/hospital (e.g. audits, surveys)? What have been the results? Have any QI activities been conducted re the Chart?</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>Overarching question/topic - Overall, what do you feel have been the benefits from implementation of the Chart? What do you feel have been the benefits of the introduction of the Subcutaneous Insulin Prescribing Chart in your LHD/hospital? [Prompts - Achieving a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists across your LHD/hospital; Reducing insulin prescribing and administrative errors; Improving the awareness and management of glycaemic control; Improving daily monitoring of both blood glucose and ketones for patients with diabetes; Improving the reporting of errors and adverse events in insulin prescribing and administration; Improving the engagement of stakeholders using the Chart]</td>
</tr>
</tbody>
</table>

### Table 5 Interview Guide - Project Team

<table>
<thead>
<tr>
<th>Domain Area</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>O’Connell Advisory has been engaged by ACI to assist in the evaluation of the Subcutaneous Insulin Prescribing Chart. The purpose for this interview is to</td>
</tr>
</tbody>
</table>
obtain feedback on the Chart since its introduction in your LHD. This will inform the development of the Evaluation Plan and Tools which will support ACI to implement the Chart throughout the state.

<table>
<thead>
<tr>
<th>The Chart in general</th>
<th>Overarching question – What happens with the use of the chart in your hospital?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• What is the trigger for the Chart to be utilised for a patient (i.e. how are patients identified as appropriate for the Chart)?</td>
</tr>
<tr>
<td></td>
<td>• Who decides? When do they decide?</td>
</tr>
<tr>
<td></td>
<td>• How is the Chart implemented for patients who present via ED?</td>
</tr>
<tr>
<td></td>
<td>• Does the preadmission process identify booked patients who will require S/C insulin during their hospital stay?</td>
</tr>
<tr>
<td></td>
<td>• Is there any executive sponsor of this project? Who?</td>
</tr>
<tr>
<td></td>
<td>• If so, who are they? What is their involvement?</td>
</tr>
<tr>
<td></td>
<td>• What gaps remain in knowledge about managing patients with diabetes on S/C insulin?</td>
</tr>
<tr>
<td></td>
<td>• Is it clear to staff under what circumstances a person would require/receive daily prescribing?</td>
</tr>
<tr>
<td></td>
<td>• What are the barriers to daily monitoring occurring?</td>
</tr>
<tr>
<td></td>
<td>• Specifically, has the daily monitoring of blood glucose and of ketones improved glycaemic control for patients</td>
</tr>
<tr>
<td></td>
<td>• Has a consistent approach to prescribing and administering S/C insulin been demonstrated by all staff?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources</th>
<th>Overarching question – how was the project resourced?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• What was allocated to assist with implementation and the chart/project management?</td>
</tr>
<tr>
<td></td>
<td>• Are any resources allocated ongoing? If so what?</td>
</tr>
<tr>
<td></td>
<td>• Are there any local data collection systems that are relevant or useful to the Chart? If so, what?</td>
</tr>
<tr>
<td></td>
<td>• What other systems exist that potentially conflict with Chart implementation?</td>
</tr>
<tr>
<td></td>
<td>• Were any extra resources provided for this project (e.g. staff, funding/in-kind support)?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation</th>
<th>• Who from your LHD/Hospital attended the ACI implementation workshop?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Are the participants still with the LHD/Hospital? Are they still involved in the Chart implementation?</td>
</tr>
<tr>
<td></td>
<td>• What were the benefits of attending? How could the workshop have been improved?</td>
</tr>
<tr>
<td></td>
<td>• Was there a project plan? If so, was the project plan reasonable in terms of timeframes and task?</td>
</tr>
<tr>
<td></td>
<td>• What did you do to promote the implementation of the Chart across your LHD/hospital (e.g. posters, newsletters)? How successful was this?</td>
</tr>
</tbody>
</table>
- What ongoing communication activities have been used to motivate users to maintain interest?
- How were key stakeholders engaged as part of the Chart implementation process (e.g. potential users, Divisional/department managers, educators, hospital exec, LHD exec, quality & safety staff)?
- Was a community of interest developed as a result? If so, who, how, when?

**Education**
- What training resources were available at time of implementation?
- What education was provided to support the implementation of the Chart? If so, who attended? How was this delivered?
- Are ongoing educational activities provided (e.g. at induction for new staff)? If so, what, who, how often?
- Are other educational activities provided about awareness and management of hyper/ hypoglycaemia? If so, who, how often?
- Is education provided about reporting errors or adverse effects re insulin use? If so, who, how often?

**Monitoring**

Overarching question/topic – In relation to the chart - is there any monitoring taking place?
- What ongoing monitoring or data collection activities are being undertaken in relation to the Chart in your LHD/hospital (e.g. audits, surveys)?
- Have you done chart audits using the ACI tool? If no, why not? If yes, what were the results? How have pharmacists been engaged in the monitoring/data collection process?
- Have you developed/adopted any data collection tools of your own? If yes, describe.
- Have any QI activities been conducted re the Chart?

**Overall**

Overarching question/topic - Overall, what do you feel have been the benefits from implementation of the Chart?
- What do you feel have been the benefits of the introduction of the Subcutaneous Insulin Prescribing Chart in your LHD/hospital? [Prompts - Achieving a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists across your LHD/hospital; Reducing insulin prescribing and administrative errors; Improving the awareness and management of glycaemic control; Improving daily monitoring of both blood glucose and ketones for patients with diabetes; Improving the reporting of errors and adverse events in insulin prescribing and administration; Improving the engagement of stakeholders using the Chart]

---

Table 6 Interview Guide - Medical officers, Nurses, Pharmacists

<table>
<thead>
<tr>
<th>Domain Area</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>O’Connell Advisory has been engaged by ACI to assist in the evaluation of the</td>
</tr>
</tbody>
</table>
Subcutaneous Insulin Prescribing Chart. The purpose for this interview is to obtain feedback on the Chart since its introduction in your LHD. This will inform the development of the Evaluation Plan and Tools which will support ACI to implement the Chart throughout the state.

<table>
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<tr>
<th>The Chart in general</th>
<th>Overarching question – What happens with the use of the chart in your hospital?</th>
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<tr>
<td></td>
<td>What is the trigger for the Chart to be utilised for a patient (i.e. how are patients identified as appropriate for the Chart)?</td>
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<td>Who decides? When do they decide?</td>
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<td>Does the preadmission process identify booked patients who will require S/C insulin during their hospital stay?</td>
</tr>
<tr>
<td></td>
<td>Is it clear under what circumstances a person would require/receive daily prescribing?</td>
</tr>
<tr>
<td></td>
<td>Specifically, has the daily monitoring of blood glucose and of ketones improved glycaemic control for patients</td>
</tr>
</tbody>
</table>

| Implementation | Were you aware of any activities used to promote the implementation of the Chart across your LHD/hospital (e.g. posters, newsletters)? If so, how successful were these? How could they have been improved? Are you aware of ongoing communication activities to motivate users to maintain interest? If so, what are they? How could they be improved? |

<table>
<thead>
<tr>
<th>Overall</th>
<th>Overarching question/topic - Overall, what do you feel have been the benefits from implementation of the Chart?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What do you feel have been the benefits of the introduction of the Subcutaneous Insulin Prescribing Chart in your LHD/hospital?</td>
</tr>
<tr>
<td></td>
<td>[Prompts - Achieving a consistent approach to prescribing and administration of subcutaneous insulin by medical officers, nurses and pharmacists across your LHD/hospital; Reducing insulin prescribing and administrative errors; Improving the awareness and management of glycaemic control; Improving daily monitoring of both blood glucose and ketones for patients with diabetes; Improving the reporting of errors and adverse events in insulin prescribing and administration; Improving the engagement of stakeholders using the Chart]</td>
</tr>
</tbody>
</table>
Appendix I  Pre LHD Site Visit Questionnaire

Introduction
ACI is undertaking an evaluation of the implementation of the NSW Subcutaneous Insulin Prescribing Chart (the Chart). The evaluation includes undertaking a site visit for the purpose of gaining feedback from key stakeholders.

Please find attached a questionnaire which collects additional information which will assist to inform the site visit.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes □</th>
<th>No □</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there an Executive Sponsor of this project?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, what is their name and position?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is their involvement with this project?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who is responsible for project governance (name and position)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is/was there a project manager for this project?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is their name, position, and contact details?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is this person responsible for implementing the Chart across the LHD?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If not, please attach a list of all people responsible for implementing the Chart across the LHD, their positions, contact details and which facilities they were responsible for.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a documented project plan or plans for implementation of the Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, please attach a copy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you have a documented project plan, is this monitored or reviewed regularly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, by who (name and position) and how frequently?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was there a communication strategy developed to support the Yes □ No □ implementation of the Chart? If yes, please attach a copy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was/is there a clinical champion(s) of the Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, how were they identified? What was their role in implementing the Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you please outline in an attached schedule a brief outline of what endocrinology services are provided to each hospital within the LHD, and on what basis?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If not, what services/supports are available to clinicians treating people with diabetes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were any hospitals in the LHD a participant in the pilot of the Chart?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who is responsible for the distribution and ongoing availability of the Chart across the LHD?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How are Charts distributed? How is availability maintained?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has a community of interest developed as a result of implementing the Chart? Yes □ No □</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, who is involved, how are they involved and how often?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many hospitals within your LHD are using the Chart? How many hospitals eligible to use the Chart are in your LHD overall?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Other evaluation data
There are several other data items we would like to have available either prior to, or on the day of the site visit.

1. Chart audits. We would like at least 15 chart audits to be completed per larger hospital (principal referral through to district hospitals) and sampling from representative smaller hospitals (community acute to multi-purpose centres) within the LHD. The Chart audit tools, including an audit instruction sheet are attached.

2. Staff surveys. We would like all medical officers, nurses and pharmacists to participate in a user survey. The user survey is electronic and should only take 10 to 15 minutes to complete. A link to the survey tool is attached for distribution to relevant staff.

3. IIMS data. We would like to review IIMS data regarding incidents involving insulin to support the evaluation process. The data should relate to a particular month post-implementation and also the similar month in the previous year, to assist comparison (e.g. June 2014, June 2013).

Could you please forward this completed form, the results of completed Chart audits and IIMS data to the nominated contacts listed below.

The Site Visit
We would like to interview key stakeholders to collect feedback, and therefore request your assistance in facilitating a site visit at your LHD. The key stakeholders should include relevant members of the LHD/Hospital Executive, particularly those responsible for project governance, the project implementation team, and focus groups with nursing staff, medical officers and pharmacists as key users of the Chart. The focus groups should have no more than 16 people per group.

The interviews with LHD/Hospital executive should take approximately half an hour, the project team should take one and one half hours and the focus groups should take up to one hour. We ask your assistance in facilitating the interviews and focus groups across all hospitals in your LHD to get representation from all professional groups and a representative cross section of hospitals within your LHD. It is envisaged that the site visit should only take 1 day.

Could you please nominate a representative from your LHD to facilitate the coordination of these interviews/focus groups and liaise with the Evaluator accordingly.

Further information
For questions or comments on the Pre Site Visit Questionnaire, or the overall evaluation process, please contact:

Rebecca Donovan
Endocrine Network Manager
Agency for Clinical Innovation
(02) 9464 4626
rebecca.donovan@aci.health.nsw.gov.au