



**ACI** NSW Agency  
for Clinical  
Innovation

REPORT

# Evaluation of the Subcutaneous Insulin Prescribing Chart in Four Local Health Districts Response to Formative Evaluation

Endocrine Network  
In-Hospital Diabetes Management Working Group

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## 1. Background

The Clinical Excellence Commission (CEC) has identified insulin as a high-risk medicine, with the potential for causing injury or harm if misused or used in error. In response, 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 a standardised subcutaneous insulin prescribing chart (the 'Chart') based on best clinical practice.

The Chart design includes the recording of daily blood glucose and ketone monitoring results in parallel to the prescribing chart, allowing staff to refer to recent readings more easily when prescribing and administering insulin doses. Supplemental doses, one-off orders and doses supplied by telephone order are all recordable in this single document.

The Chart was piloted in two Local Health Districts (LHDs) in 2012 (hospital wide at Ryde Hospital and in three wards of Royal Prince Alfred Hospital – antenatal, general surgical and the endocrine/renal ward). A rural facility had agreed to participate in the pilot but then withdrew. The Chart was released for state-wide implementation November 2013.

O'Connell Advisory was engaged in 2014 by ACI to evaluate the success of the implementation of the Chart within two LHDs: Sydney LHD (SLHD) and Western NSW LHD (WNSWLHD). Following the release of the draft evaluation report in early 2015, O'Connell Advisory was engaged to undertake an evaluation in a further two LHDs: Illawarra Shoalhaven LHD (ISLHD) and Northern Sydney LHD (NSLHD). The evaluation is formative, 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 project.

The ACI Endocrine Network, In-Hospital Diabetes Management Working Group is pleased to respond to the findings and recommendations of the O'Connell Advisory evaluation.

## 2. Key Findings of Evaluation Report

1. The resources developed by ACI to support the implementation of the Adult Subcutaneous Insulin Prescribing Chart focused upon the 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 and the change from sliding scale insulin to supplemental insulin. These necessary changes to practice may have hampered implementation and uptake of the Chart.
2. Feedback from focus groups and results of chart audits suggested 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. Issues included:
  - Daily prescribing of subcutaneous insulin on a timely basis to ensure timely administration,
  - Routine monitoring of Blood Glucose Levels (BGLs) and ketones,
  - Use of supplemental insulin when BGLs go over an indicated range, and
  - The ability to view all of the above in one area of the patient record, namely the subcutaneous insulin chart.
3. The resources provided to support implementation had the following limitations:
  - The ACI's expectations regarding the role and responsibilities of the LHD Executive Sponsor, Project Leads and Clinical Champions were unclear,
  - There was limited ACI project governance, and
  - There was only one ACI implementation workshop conducted in Sydney, 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.***

### 3. Key Recommendations of Evaluation Report

- 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.

### 4. In-Hospital Diabetes Management Working Group Response

The ACI Endocrine Network appreciates the work done by O'Connell Advisory and the *Evaluation of the Subcutaneous Insulin Prescribing Chart in Four LHDs* report. However, some key issues raised in the report need additional comment or clarification.

***“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”*** (Executive Summary page 4).

This is a pre-existing problem, well known to endocrinology units, which has been brought to wider attention because of the implementation of the insulin chart. (Addressed in #2 of action plan to follow)

***“The change from sliding scale insulin to supplemental insulin may not be well understood as observed during the chart audit”*** (Executive Summary Page 4).

Sliding scale insulin has been out-dated and discouraged by most endocrinology units for 20 or so years, yet its use in the hospital system remains pervasive. The change to supplemental insulin will need a response that addresses both cultural practices as well as the educational needs of prescribing physicians. (Addressed in #2 of action plan to follow)

***“Glycaemic Control, only 20 of 50 (40%) charts reviewed had supplemental orders written up”*** (page 21, paragraph 5).

The prescription of supplemental insulin is not considered essential in all cases even when the patient has high BGL readings. The report has identified that only 40% of charts audited had supplemental insulin orders “written up”. Consequently in many cases, there were BGLs above 10 mmol/L which were not treated. There are situations where tight control is not desirable (e.g. elderly, people prone to hypoglycaemia). A clinical judgement should be made as to whether supplemental insulin is appropriate. (No action required)

***“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”*** (page 44, paragraph 2).

It is exceptionally rare for a patient to require more than 14 tests a day if they are not on an insulin infusion, in which case the BGLs would be recorded on a separate chart (e.g. BG record for insulin infusions). The main situation where a patient not on an infusion might need more frequent monitoring is in the situation of recurrent hypoglycaemia. However for these patients there are an additional four slots available to record the BGLs. (No action 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”*** (page 22, section 4.6).

Routine monitoring of ketones is not required for patients with type 2 diabetes. It is only required for type 1 diabetes, and even then only if the patient has high BGLs. The threshold is determined by local policy as there is no standardised glucose level at which ketone testing should occur for type 1 diabetes. (No action required).

## 5. ACI's Response and Action Plan for Recommendations

	Report Recommendation	Comment from Working Group	Action	Proposed date for delivery
1	<i>"Review of the format of the Chart to improve its readability and legibility" (page 25, section 5).</i>	Accepted. Recommendation to be actioned.	ACI In-Hospital Diabetes Management Working Group will meet yearly to review chart and collaborate with State Forms to assure any changes are compliant and that LHD/SHNs are involved in consultation	February 2016 and yearly thereafter
2	<i>"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" (page 25, section 5).</i>	Accepted. Implementation of the insulin chart has brought an understanding to many hospitals regarding the need for training of their medical staff in best practice hospital insulin management. Ensure that education provided includes the appropriate frequency of BG monitoring and the use of alternatives for patients on insulin infusions. Promote education to doctors that daily prescribing is for a 24 hour period not a physical day and should fit with ward rounds or routine prescriber availability to maximise patient outcomes.	ACI Endocrine Network will continue to support LHDs through content expert training using: <ul style="list-style-type: none"> <li>• On site teaching</li> <li>• Webinars/WebEx and videoconference</li> <li>• On-demand viewing capability of recorded presentations</li> <li>• Explore eLearning module for diabetes inpatient management through collaboration with HETI</li> <li>• Inclusion of in-patient diabetes management and use of the Chart in rollout of Diabetes Mellitus Model of Care.</li> </ul>	Commenced September 2015 Ongoing  September 2016  June 2016
3	<i>"Develop resources to support the LHDs in developing a systematic approach to ensure daily prescribing occurs on a timely basis for all acute facilities" (page 25, section 5).</i>	Accepted. The Chart has brought about the recognition regarding the need for safer insulin prescribing practices.	In addition to strategies listed above ACI will be working with LHD managers and clinicians to encourage the consideration of: <ul style="list-style-type: none"> <li>• Training for RMOs during orientation regarding proper insulin prescribing practices</li> <li>• Nurse or pharmacy initiated systems to remind RMOs to chart insulin in a timely manner</li> <li>• Incorporating strategies used in Mid-North Coast LHD to send a group page to all RMOs at the end of the working day to remind them to chart insulin for that evening and the next day.</li> </ul>	Ongoing

	Report Recommendation	Comment from Working Group	Action	Proposed date for delivery
4	<i>“Provide guidance to LHDs about seeking exemption for those facilities with long term patients” (page 25, section 5).</i>	Accepted. Recommendation to be actioned.	ACI will work with State Forms to provide criteria outlining when the Chart is not suitable.	February 2016
5	<i>“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” (page 25, section 5).</i>	Accepted. The Chart currently states that these guidelines are not intended to replace individual clinical judgement. The NSW Adult Subcutaneous Insulin Prescribing Chart User Guide provided by ACI states that <i>“glycaemic management guidelines do not take the place of local policies and are not intended to replace, individual clinical judgment.”</i>	As part of Chart format review, working group to consider adding the words “local policy” to Chart disclaimer.	February 2016
6	<i>“Review of the format of the Chart” (page 25, section 5.1).</i> • <i>the option to graph BGLs (some support by key stakeholders)”</i>	Not supported. If a graph is included, the space for other components of the chart would by necessity be even smaller. Furthermore, it is considered that having a graph would increase the workload as the recording of the BG result would have to be duplicated, and this in itself increases the risk of error (e.g. discordance between the written BG and graphed BG can occur).	No graph to be included.	N/A

	Report Recommendation	Comment from Working Group	Action	Proposed date for delivery
7	<p><i>“Review of the format of the Chart” (page 25, section 5.1).</i></p> <ul style="list-style-type: none"> <li><i>• the colour of the spine of the chart to distinguish it from other charts.”</i></li> </ul>	<p>Accepted. Recommendation to be actioned.</p>	<p>Part of Chart review.</p>	<p>February 2016</p>
8	<p><i>“Review of the format of the Chart” (page 25, section 5.1).</i></p> <ul style="list-style-type: none"> <li><i>• include an option for doctors to specify the frequency of ketone monitoring.”</i></li> </ul>	<p>Not supported. Clinically for a patient not on an insulin infusion, the need for ketone testing is not dictated by frequency, but rather, the type of diabetes and the BGL. At present, it is possible give the glucose level at which ketone testing should occur in the <i>“Special Instructions”</i>.</p>	<ul style="list-style-type: none"> <li>• Chart will not be altered</li> <li>• Include education regarding ketone monitoring in content-expert training (strategies addressed above).</li> </ul>	<p>N/A</p>
9	<p><i>“LHDs undertake a review, using the ACI Chart Audit tool developed to ensure that daily prescribing occurs in a systematic, consistent and timely manner” (page 25, section 5.1)</i></p>	<p>Accepted. A Chart review audit tool was provided by ACI at the time of Chart implementation.</p>	<p>ACI to work with LHDs to encourage ongoing quality assurance be undertaken by individual facilities according to their own policy.</p>	<p>Ongoing</p>
10	<p><i>“Consider determining which positions are responsible for undertaking these duties, and timing” (page 25, section 5.1)</i></p>	<p>Not supported. Out of scope for working group.</p>	<p>LHD and facility responsibility.</p>	<p>N/A</p>
11	<p><i>“Consider approaches for those facilities where there may be limited on-site medical cover after hours, during weekends and public holidays” (page 26, section 5.1)</i></p>	<p>Accepted.</p>	<p>ACI to work with LHD managers and clinicians to develop strategies to support facilities where on-site medical cover is limited.</p>	<p>Ongoing</p>