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# Supporting Information

## Supplementary methods



Appendix to: Donovan P, Eccles-Smith J, Hinton N, et al. The Queensland Inpatient Diabetes Survey (QuIDS) 2019: the bedside audit of practice. *Med J Aust* 2021; doi: 10.5694/mja2.51048.

**1. Bedside Questionnaire: Queensland Inpatient Diabetes Survey 2019**

# Bedside Questionnaire

## Queensland Inpatient Diabetes Survey 2019

There is a diabetes inpatient survey being carried out in your hospital on a specified day between 18 – 29 March 2019.

All diabetes inpatients will be asked to complete a questionnaire about the care they have received during their hospital stay but we also need some information from hospital staff on the patient's diabetes type and treatment.

**What we would like you to do**

For each diabetes inpatient there will be a Patient Experience questionnaire for the patient to complete and an associated Bedside Questionnaire form. The Patient Experience and Bedside Questionnaire can be completed electronically (direct data entry via Survey Monkey) or with paper-based data collection. Please note, that each hospital is responsible for their own data entry of any paper-based data collection into Survey Monkey.

If the patient is fit and well, please discuss the audit with them, provide them with or conduct with them the Patient Experience questionnaire. Then complete the Bedside Questionnaire form based on that patient's information from their notes. Where the patient is not fit to complete the Patient Experience questionnaire, please proceed directly to completion of the Bedside Questionnaire.

If paper based data collection is undertaken, sometimes you will find the box you have ticked has an instruction to go to another question. By following the instructions carefully, you will miss out questions that do not apply to that patient. For electronic data collection, you will automatically be directed to the next relevant question. Please do not write any patient identifiable information on the questionnaires (including, name, DOB, address, etc.)

All data entry must be entered into Survey Monkey by 12 April 2019. Any data entered after this data is unlikely to be included in the audit results.

**How will this information be used?**

The results from the audit will be used to help us find ways to improve the inpatient experience, where needed. It will be used to see how satisfied patients are with the support and services they receive, to see whether improvements need to be made to local care services and for further research and analysis.

Results will be published in a public report so that patients can look at the overall findings. Results will also be available at hospital level which will be accessible to healthcare professionals and others, such as those acting on behalf of patients, to help them understand how their results compare to other hospitals around Queensland.

Responses to this questionnaire may also be held at the hospital to allow for local analysis and service improvement.

If you need any help or have any questions please contact the audit team via Statewide_Diabetes_Network@health.qld.gov.au.

**THANK YOU for reading this and for contributing to this valuable piece of work**

Version 0.7 – 20.09.2018

## Section A: Background Information

1.Specialty of Ward and Primary Treating Consultant providing care? Please tick (one box only)

| | Specialty of Ward | Specialty of Treating Consultant |
|---|---|---|
| ICU/HDU | | |
| Acute/ General Medicine | | |
| Cardiology | | |
| Geriatrics/ Rehabilitation | | |
| Diabetes and endocrinology | | |
| Gastroenterology | | |
| Haematology | | |
| Oncology | | |
| Other - Medical | | |
| Renal | | |
| Respiratory | | |
| Stroke | | |
| Cardiothoracic Surgery | | |
| Ear Nose and Throat Surgery | | |
| General Surgery | | |
| Gynaecology | | |
| Orthopaedic | | |
| Other – Surgical | | |
| Vascular Surgery | | |
| Mental Health | | |

2. Patient age?

Please write number in the box below

3. Patient gender?

Please tick (one box only)

☐ Male ☐ Female

☐ Indeterminate

4. Patient Indigenous status? Please tick (one box only).

☐ Aboriginal ☐ Neither

☐ Torres Strait Islander ☐ Both Aboriginal and Torres Strait Islander

5. Patient diabetes type on admission? Please tick (one box only).

☐ Type 1

☐ Type 2

☐ Other

6. Patient diabetes treatment regimen on admission. Please tick all that applies

☐ Insulin

☐ Tablets

☐ Non-insulin injectables

☐ Diet and lifestyle modification only

7. Please tick all that formed part of the patient's diabetes treatment regimen on admission. (If unsure which group a medication falls into, please check with diabetes team or pharmacist).

**Insulin:**

☐ Basal insulin

☐ Prandial/mealtime insulin

☐ Pre-mixed insulin

☐ Insulin pump

**Tablets:**

☐ Metformin

☐ Sulphonylureas

☐ DPP4 – inhibitors

☐ SGLT-2 inhibitors

☐ Acarbose

☐ Glitazones

☐ Fixed dose combination tablet

**Non-insulin injectables:**

☐ GLP-1 analogues

8. Is the patient having enteral (tube) feeding? Please tick (one box only).

☐ Yes ☐ No

9. How long has the patient had diabetes? Please tick (one box only).

☐ Diabetes diagnosed during this admission

☐ < 5 years

☐ 5-9 years

☐ 10-14 years

☐ 15-29 years

☐ > 30 years

☐ Unknown

*Preferred source of information is the patient's notes – otherwise ask the patient*

10. Number of nights in hospital? Please write number of nights in the box.

| |
|---|
| |

11. Type of admission? Please tick (one box only).

☐ Elective ☐ Emergency ☐ Transfer from another hospital

12. Main reason for admission. Please tick (one box only).

**Note: this may differ from the diagnosis at the time of the audit**

☐ Non- diabetes related medical

☐ DKA

☐ HHS (HONK)

☐ Active diabetic foot disease

☐ Hypoglycaemia

☐ Hyperglycaemia with established diabetes

☐ Non-medical (general surgery, orthopaedics, ENT, etc.)

**Questions 13 - 21, are related to diabetic complications. The presence or absence of complications can be based on knowledge at admission (i.e. from admission note) or diagnosis made during admission**

13. Is there any evidence of chronic kidney disease?

☐ Yes – go to Q14 ☐ No – go to Q15 ☐ Unsure – go to Q15

14. What stage of chronic kidney disease? Please tick (one box only).

☐ eGFR > 60 mL/min.1.73m2 BSA - CKD stage 1 or 2

☐ eGFR 30-59 mL/min.1.73m2 BSA - CKD stage 3

☐ eGFR 15-29 mL/min.1.73m2 BSA - CKD stage 4

☐ eGFR <15 mL/min.1.73m2 BSA - CKD stage 5

☐ Renal replacement therapy (eg. haemodialysis or peritoneal dialysis and transplantation)

15. Any evidence of the following diabetic complications:

| | Yes | No | Unsure |
|---|---|---|---|
| Foot disease? (Previous ulcer, amputation, Charcot's arthropathy) | | | |
| Documented diabetic neuropathy? | | | |
| Diabetic eye disease? | | | |
| Peripheral vascular disease? | | | |
| Ischaemic heart disease? | | | |
| Previous stroke or transient ischaemic attack? | | | |

16. Smoking history. Please tick (one box only).

☐ Current - Go to Q17 ☐ ex-smoker - Go to Q17
☐ never smoked – Go to Q18 ☐ unknown - Go to Q18

17. Please estimate pack-year history (please write a number in the box)

| |
|---|
| |

*NB. One pack-year equals the equivalent of 20 cigarettes per day for one year. Therefore, 40 cigarettes per day for 10 years equals 20-pack years.*

## Section B: Diabetes Control

18. Is a recent HbA1c recorded (within last 3 months in notes or AUSLAB)? Please tick (one box only).

☐ Yes ☐ No If yes, please record_____%

19. Did the patient develop DKA or HHS during this admission (not including at presentation? Tick (which apply)

☐ DKA ☐ HHS ☐ Neither

20. Is the insulin and glucose monitoring chart available for review? Please tick (one box only).

NB. If patient is currently in DKA or HHS or currently on intravenous infusion of insulin, please answer no to this question.

☐ Yes - Go to Q21 ☐ No - Go to Q34

21. Was the patient doing any of the following at any time in the last 5 days (during inpatient stay). Please tick (where applicable).

| | Yes | No | Unsure | N/A |
|---|---|---|---|---|
| Self-testing glucose | | | | |
| Self-administering insulin | | | | |
| Self-adjusting insulin dosage | | | | |

22. How many days of blood glucose monitoring and/or insulin doses are available for review (up to maximum of 5 days). Please enter a number in the box.

*NB: Having 5 days of blood glucose monitoring and insulin doses will be optimal, in order to provide an adequate sample of diabetes management in this audit. This may not always be possible (if a patient has been an inpatient for less than 5 days). If it is possible to obtain up to 5 days' worth of data, which may mean trying to access a previous monitoring chart, please attempt to do this, but it is understood that this may not always be possible.*

23. Looking at the glucose monitoring chart, for up to the last 5 days, on how many days was the frequency of monitoring appropriate? Please enter the appropriate number of days, based on the guidance below.

*Appropriate frequency of monitoring:*

- *For long stay patients with well controlled blood glucose levels - At least once a week*
- *Metformin or diet alone - At least once a day*
- *Insulin, SU, DPP4-inhibitors, glitazones, SGLT-2 inhibitors and GLP-1 analogues and stable blood glucose - At least twice a day*
- *Unwell, unstable diabetes or basal bolus insulin - At least four times a day*

**For Q24 – 29, count only blood glucose readings separated by a 4-hour period (i.e., if there were 3 tests in a 4 hour period this would only count as one episode). On the days identified in Q22, i.e. up to the last 5 days.**

24. Number of blood glucose readings **between 3 - 3.9 mmol/L**

☐ Zero - Zero got to Q27

☐ More than Zero, please enter in box

**Please answer the following for glucose readings between 3-3.9mmol/L.**

25. Was the treatment of all episodes of hypoglycaemia (3 – 3.9 mmol/L) documented?

☐ Yes ☐ No

26. Was the treatment of all episodes in accordance with statewide guidelines?

☐ Yes ☐ No

*NB: Refer to the back of the statewide subcutaneous insulin chart*

**Please answer the following for glucose readings less than 3mmol/L**

27. Number of blood glucose readings **less than 3 mmol/L**. Please write in the box.

☐ Zero - Go to Q32

☐ More than Zero, please enter in box

28. Was the treatment of all episodes of hypoglycaemia (<3mmol/L) documented?

☐ Yes ☐ No

29. Was the treatment of all episodes in accordance with statewide guidelines?

☐ Yes ☐ No

30. Number of episodes of hypoglycaemia requiring injectable treatment (glucagon or IV glucose). Please write in the box.

| |
|---|
| |

31. If there has been hypoglycaemia (any glucose **below 4mmol/l** in a 4-hour period) during last 5 days (or maximum available days, up to 5 days) please indicate the number of episodes in each of the following time periods. (Please complete the table below):

*For this question only (unlike Q24-Q29), if there were 3 tests in a 4-hour period this would count as **three** episodes).*

| Time of Day | Number of hypoglycaemic episodes (readings between 3 – 3.9 mmol/L) | Number of hypoglycaemic episodes (readings <3 mmol/L) |
|---|---|---|
| 09:00-12:59 | | |
| 13:00-16:59 | | |
| 17:00-20:59 | | |
| 21:00-00:59 | | |
| 01:00-04:59 | | |
| 05:00-08:59 | | |

32. What level of blood glucose is appropriate for this patient? Please tick (one box only).

☐ Between the 5-10 mmol/L target (ADS inpatient guideline targets)

☐ Symptomatic (e.g. terminal/palliative care, frailty, cognitive impairment) - If Symptomatic go to Q34 (*these patients would not be expected to have 'good diabetes days')*

33. Number of 'good diabetes days' in the last 5 days (or maximum available days up to 5 days), as per (Q22) and there is no more than one reading more than 10 mmol/L and none less than 5 mmol/L

*A '**good diabetes day'** is defined as a day in which the frequency of monitoring was appropriate (See Q23) and there are no more than one reading more than 10mmol/L and none less than 5mmol/L per day*

| |
|---|
| |

## Section C: Prescribing and Drug Management Errors

**For Q34 to Q39, please refer to the last 5 days of diabetes therapy (or maximum available days of insulin therapy, up to 5 days, as per answer to Q22)**

34. Did the patient receive insulin (subcutaneous or intravenous) at any time during the last 5 days (or maximum available data up to 5 days)? Please tick (one box only).

☐ Yes ☐ No – Go to question 37

**For Q35 and Q36 any of the following occur?** Please tick (where applicable).

35. Insulin prescription errors

| | Yes | No | N/A |
|---|---|---|---|
| Insulin not written up | | | |
| Name of insulin incorrect (e.g. Humalog) Number (dose) unclear | | | |
| Unit abbreviated to 'u' or written unclearly | | | |
| Insulin or prescription chart not signed by prescriber | | | |
| Insulin not signed as given | | | |
| Insulin given/prescribed at the wrong time | | | |

36. Insulin management errors

| | Yes | No | N/A |
|---|---|---|---|
| No action taken when persistent BG >16 mmol/L (more than one day or 3 consecutive) and better glycaemic control appropriate | | | |
| Insulin not increased when persistent BG >10 mmol/L and <=16mmol/L and better glycaemic control appropriate for this patient | | | |
| Insulin not reduced if unexplained BG <5mmol/L | | | |
| Inappropriate omission of insulin after episode of hypoglycaemia | | | |

37. Was the medication chart available for review? Please tick (one box only).

☐ Yes - Go to Q38 ☐ No - Go to Q40

**For Q38 and Q39, did any of the following occur? Please tick (where applicable).**

38. Oral Hypoglycaemia Agent (OHA) prescription errors

| | Yes | No | N/A |
|---|---|---|---|
| OHA not signed as given | | | |
| OHA given/prescribed at the wrong time | | | |
| Wrong dose | | | |
| OHA not written up | | | |

39. Oral Hypoglycaemic Agent management errors

| | Yes | No | N/A |
|---|---|---|---|
| No action taken when persistent BG >16 mmol/L (more than one day or 3 consecutive) and better glycaemic control appropriate | | | |
| No action taken when persistent BG >10 mmol/L (as per above) and <=16 mmol/L and better glycaemic control appropriate | | | |
| OHA not reduced if unexplained BG <5mmol/L | | | |
| Inappropriate omission of OHA after episode of hypoglycaemia | | | |

## Section D: Intravenous Insulin Infusions

This section must be answered only by a member of the diabetes team. Please tick (one box only).

40. Has the patient been on an insulin infusion during the last 5 days?

☐ Yes - Go to Q41 ☐ No - Go to Q49

**Thinking of the most recent use of an insulin infusion, please complete questions 41-44;**

41. Duration on insulin infusion?

☐ <1 day ☐ 1 to <2 days ☐ 2 to <4 days ☐ 4 to <7 days ☐ > 7 days

42. For the entire duration of the insulin infusion, was it appropriate for the patient to be receiving it (e.g. not eating or drinking)

☐ Yes - Go to Q44 ☐ No - Go to Q43

43. If the period of insulin infusion was inappropriate what was the approximate number of excess days on infusion? Answer n/a if the period was appropriate. (see guidance notes)

44. If discontinued, has the transfer to s.c. insulin been managed appropriately (e.g. s.c. insulin or oral therapy introduced before infusion stopped)?

☐ Yes ☐ No ☐ Not sure

45. Has the patient been on an insulin infusion for less than 24 hours?

☐ Yes – Go to Q50 ☐ No – Go to Q46

46. What was the total number of glucose readings in the last 24 hours on infusion.

47. Total number of glucose readings > 10 mmol/L in the last 24 hours on infusion.

48. Total number of glucose readings >=3 and <4 mmol/L in the last 24 hours on infusion.

49. Total number of glucose readings < 3 mmol/L in the last 24 hours on infusion.

## Section E: Involvement of the Specialist Diabetes Team

50. Is there documented evidence of the patient being seen by a member of the specialist diabetes team (e.g. Endocrinologist, diabetes educator, dietician, podiatrist)?

☐ Yes ☐ No

51. Should the patient have been referred to the diabetes team? See below.

☐ Yes ☐ No ☐ Unsure

*Suggested referral criteria:*

- *Diabetic ketoacidosis (DKA)*
- *Hyperglycaemic Hyperosmolar Syndrome (HHS)*
- *Diabetic foot infection*
- *Patients with Type 1 diabetes at their request*
- *Patient treated with an insulin pump (CSII)*
- *Persistent hyperglycaemia (blood glucose > 10 mmol/L for 48 hours)*
- *Severe hypoglycaemia (reduced conscious level or glucose <2.5 mmol/L) or recurrent episodes (more than two episodes in 48 hours)*
- *Type 2 diabetes new to insulin therapy*
- *Intravenous insulin infusion for over 48 hours or if glucose outside limits for more than 5 consecutive hours*
- *Admitted for urgent and major elective surgical procedure AND HbA1c > 8.5%*
- *Acute Coronary Syndrome and HbA1c > 7.5% or new diagnosis of diabetes*
- *Patient treated with U500 insulin or U300 insulin*

## Section F: General Foot Care

This section is to be filled in for all patients. Please answer the following.

52. Was the patient admitted with active foot disease?

☐ Yes - and patient was seen by a member of the MDFT within 24 hours? Go to Q55

☐ Yes - and patient was **NOT** seen by a member of the MDFT within 24 hours? Go to Q55

☐ No – Go to Q53

*A Multidisciplinary Diabetes Footcare Team (MDFT) is defined as a team consisting of medical, surgical, nursing, podiatry and allied health professionals with appropriate skills and knowledge needed to manage patients with diabetic feet. These members must be in weekly contact.*

53. Was there any documentation of specific diabetic foot risk (for ulceration) examination in the FIRST 24 hours of admission? (does not include Waterlow score, Norton score and similar general pressure sore checks)

☐ Yes ☐ No ☐ Unsure

54. Did a foot lesion (e.g. heel ulcer) arise during this admission?

☐ Yes - and patient was seen by a member of the MDFT within 24 hours? Go to Q55

☐ Yes - and patient was **NOT** seen by a member of the MDFT within 24 hours? Go to Q55

☐ No – Go to Q53

55. Has there been MDFT input in the last 7 days?

☐ Yes ☐ No ☐ Unsure ☐ N/A

## Section G: Pre-operative care planning

56. Has the patient had surgery in the current admission? Please tick (one box only).

☐ Yes - Go to Q57 ☐ No - Questionnaire complete

If the patient has had more than one surgery during this admission, answer Q57- Q60 about the first surgery.

57. Nature of surgery? Please tick (one box only).

☐ Elective ☐ Emergency ☐ Unsure

58. Pre-operative assessment record available for review? Please tick (one box only).

☐ Yes - Go to Q59 ☐ No - Questionnaire complete

59. Does the pre-operative assessment note that the patient has diabetes? Please tick (one box only).

☐ Yes - Go to Q60

☐ No - Questionnaire complete

☐ N/A - Diabetes diagnosed during this admission - Questionnaire complete

60. Was there evidence of a plan for the management of the patient's diabetes in the perioperative period? Please tick (one box only).

☐ Yes ☐ No

# Thank you for your help answering these questions

*Please return alongside the completed Patient Experience questionnaires in the large freepost envelopes provided in your audit pack addressed to: Need to work out logistics of data entry*

**2. Definitions of medication errors**

Table 1. Insulin prescription errors

| |
|---|
| Insulin not written up |
| Name of insulin incorrect (eg, Humalog) or number (dose) unclear |
| Unit abbreviated to 'u' or written unclearly |
| Insulin or prescription chart not signed by prescriber |
| Insulin not signed as given |
| Insulin given/prescribed at the wrong time |

Table 2. Insulin management errors

| |
|---|
| Insulin not increased when persistent blood glucose > 16 mmol/L (more than one day or three consecutive days) and better glycaemic control appropriate |
| Insulin not increased when persistent blood glucose > 10 mmol/L and ≤ 16 mmol/L and better glycaemic control appropriate for this patient |
| Insulin not reduced if unexplained blood glucose < 5 mmol/L |
| Inappropriate omission of insulin after episode of hypoglycaemia |

Table 3 Oral hypoglycaemic agent (OHA) prescription errors

| |
|---|
| OHA not signed as given |
| OHA given/prescribed at the wrong time |
| Wrong dose |
| OHA not written up when should have been |

Table 4. Oral hypoglycaemic agent (OHA) management errors

| |
|---|
| No action taken when persistent blood glucose > 16 mmol/L (more than one day or three consecutive days) and better glycaemic control appropriate |
| No action taken when persistent blood glucose > 10 mmol/L and ≤ 16 mmol/L and better glycaemic control appropriate for this patient |
| OHA not reduced if unexplained blood glucose < 5 mmol/L |
| Inappropriate omission of insulin after episode of hypoglycaemia |

A prescription error was defined as any anti-diabetic agent order that might lead to an incorrect dose being administered (tables 1 and 3). **Prescription errors** could be either related to insulin (**Insulin prescription error:** table 1) or an oral anti-diabetic agent (**Oral hypoglycaemic agent prescription error:** table 3). **Management errors** were defined as a failure to appropriately adjust therapies in response to hyper- or hypoglycaemia (tables 2 and 4). A patient was counted as having an error if they had one or more error from a given category.

**Medication errors** included any prescription or management errors; a patient was counted as having a Medication Error if they had one or more error in any of the four error category types in tables 1–4).

**Insulin errors** were defined as either prescription or management errors related to insulin use (one or more error from tables 1 and 3).

**3. Participating hospitals**

| | |
|---|---|
| Beaudesert Hospital | 64 Tina St, Beaudesert QLD 4285 |
| Boonah Hospital | 11-17 Leonard St, Boonah QLD 4310 |
| Caboolture Hospital | 97-120 McKean St, Caboolture QLD 4510 |
| Cairns Hospital | Cairns Hospital, 165 Esplanade, Cairns City QLD 4870 |
| Charleville Hospital | 72 King St, Charleville QLD 4470 |
| Dalby Hospital | Hospital Rd, Dalby QLD 4405 |
| Esk Hospital | 30 Highland St, Esk QLD 4312 |
| Gold Coast University Hospital | 1 Hospital Blvd, Southport QLD 4215 |
| Gympie Hospital | 12 Henry St, Gympie QLD 4570 |
| Ipswich Hospital | Chelmsford Ave, Ipswich QLD 4305 |
| Kingaroy Hospital | 166 Youngman St, Kingaroy QLD 4610 |
| Laidley Hospital | 75 William St, Laidley QLD 4341 |
| Logan Hospital | Armstrong Rd &, Loganlea Rd, Meadowbrook QLD 4131 |
| Mater Public Hospital Brisbane | Raymond Terrace, South Brisbane QLD 4101 |
| Mitchell Multipurpose Health Service | 95 Ann St, Mitchell QLD 4465 |
| Mt. Isa Hospital | 30 Camooweal St, Mount Isa QLD 4825 |
| Princess Alexandra Hospital | 199 Ipswich Rd, Woolloongabba QLD 4102 |
| Redcliffe Hospital | Anzac Avenue, Redcliffe QLD 4020 |
| Redland Hospital | Weippin St, Cleveland QLD 4163 |
| Robina Hospital | 2 Bayberry Ln, Robina QLD 4226 |
| Roma Hospital | 197-243 McDowall St, Roma QLD 4455 |
| Royal Brisbane and Women's Hospital | Butterfield St, Herston QLD 4029 |
| Stanthorpe Hospital | 8 McGregor Terrace, Stanthorpe QLD 4380 |
| Sunshine Coast University Hospital | 6 Doherty St, Birtinya QLD 4575 |
| Toowoomba Hospital | 154 West St, South Toowoomba QLD 4350 |
| Townsville Hospital | 100 Angus Smith Dr, Douglas QLD 4814 |
| Warwick Hospital | 56 Locke St, Warwick QLD 4370 |