

### Contents

Introduction – why a QI project about the perioperative care of people with diabetes? .....	2
Defining the project goal .....	2
Background: RCS QI collaboratives.....	3
Perioperative care of patients with diabetes QI collaborative .....	5
Delivery of project .....	5
Cohort size and eligible sites.....	5
Site requirements.....	5
Data collection for “DiaSurg” .....	5
Phases and timeline.....	6
Site recruitment.....	7
Suggested bundles or metrics.....	7
Suggested Mini bundle for each patient .....	8
Suggested diabetes bundle for an individual patient .....	8
Suggested metrics for an organisation: .....	10
Appendix 1 Case capture database .....	12
Input page.....	12
Output page (dashboards) .....	12
Appendix 2 REDCap database .....	14
Input page.....	14
Appendix 3: Suggested role description for local use by each hospital/Trust/Board who should appoint a clinical lead for perioperative care: .....	15

### Introduction – why a QI project about the perioperative care of people with diabetes?

Perioperative care of people with diabetes is often poor, although many of the interventions required are simple. This project will focus on improving perioperative care of people with diabetes. It will work across the whole perioperative pathway, with patients, specialties and disciplines.

The Centre for Perioperative Care (CPOC) published a guideline for the perioperative management of patients with diabetes<sup>1</sup>. The guideline has clear recommendations for patients, staff and organisations. This QI project will support better care by focusing on recommended steps.

The NCEPOD 2018 report 'Highs and lows'<sup>2</sup> identified that there is a huge variation in how patients with diabetes undergoing surgery are managed, including:

- only 42% are referred with a blood test HbA1c within the last 3 months
- Halving of mortality where protocols are used for patients with diabetes undergoing cardiac surgery
- perioperative hyperglycaemia found to be associated with increased length of stay and hospital complications after non-cardiac general surgery
- 46.9% of patients did not have capillary blood glucose recorded intra-operatively
- 43.4% of pre-operative assessment clinics did not have a specific policy for management of diabetes patients undergoing surgery
- 19.4% of patients' reviewers stated that the patient not been scheduled appropriately for surgery (eg first on morning or afternoon list)
- 9.1% (18/198) of hospitals with a selection policy for day surgery excluded patients with diabetes from day surgery treatment

Improvement in care would improve outcomes and reduce complications and length of stay. This would also reduce financial costs and improve satisfaction for staff and patients. (The clinical lead will help define how such items might be measured.)

### Defining the project goal

- The goal will need to be defined prior to recruiting sites and then further defined by the sites at the first meeting. The goal should be specific and measurable.
- When appointed, the interim clinical lead for the scoping phase of the project will assess all options in the suggested outcome metrics and consider which to retain to ensure good data collection and good effectiveness.
- It may be useful to create a care bundle similar to the Sepsis Six<sup>3</sup> care bundle. Several topics could be identified from the [Perioperative Care of People with Diabetes Undergoing Surgery](#) as the basis for the bundle.

The Sepsis Six care bundle comprises:

1. Give oxygen to maintain saturations >94%.
2. Take blood cultures and consider source control.
3. Administer empiric intravenous antibiotics.
4. Measure serum lactate and send full blood count.
5. Start intravenous fluid resuscitation.
6. Commence accurate urine output measurement

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<sup>1</sup> <https://www.cpoc.org.uk/guidelines-resources-guidelines-resources/guideline-diabetes>

<sup>2</sup> <https://www.ncepod.org.uk/2018pd.html>

<sup>3</sup> <https://www.england.nhs.uk/wp-content/uploads/2015/08/Sepsis-Action-Plan-23.12.15-v1.pdf>

- It may be useful to have other metrics to assess organisational alignment with the guideline, showing a change of culture permitting implementation.

## Background: RCS QI collaboratives

### Chole-QulC

RCS England ran a QI project to improve the care of people with gall bladder disease (cholecystitis). 13 sites participated in [Cholecystectomy Quality Improvement Collaborative \(Chole-QulC\)](#) which ran from October 2016 to January 2018. The collaborative was successful in its aim of reducing time to urgent cholecystectomy for eligible patients as outlined in the evaluation paper published in BJS Open<sup>4</sup>. This identified key factors that enabled hospitals to succeed and overcome challenges to improvement. The importance of structured support provided by participation in an improvement collaborative was identified as a factor key to success.<sup>5</sup>

### CholeQulC-ER

RCS Eng launched its first subscription based collaborative, [Cholecystectomy Quality Improvement Collaborative-Extended Reach \(CholeQulC-ER\)](#), from July 2019 to December 2020. 22 trusts / health boards participated in the project. The project offered sites the opportunity to radically improve outcomes for patients with gallstone disease using proven quality improvement methods and implementing the learning from Chole-QulC.

- During the course of the project, the cohort's variation was reduced.
- The full CholeQulC-ER cohort improved their 8-day surgery rate and average time to surgery during the collaborative period.
- The average time to surgery dropped from 37 days (July 2019 – Nov 2019) to 15 days by the end of the project.
- The cohort's 8-day rate improved, ending the project in December 2020 with an average 8-day rate of 18.6% (compared to the control rate of 12.4%).
- When gallstone services restarted in July 2020, CholeQulC-ER sites recovered more quickly than control sites, see Figure 1 below.
- The majority of CholeQulC-ER sites improved their 8-day surgery ranking. One site increased its ranking by 81 places, and the top two 8-day dates across England and Wales are now held by CholeQulC-ER sites.

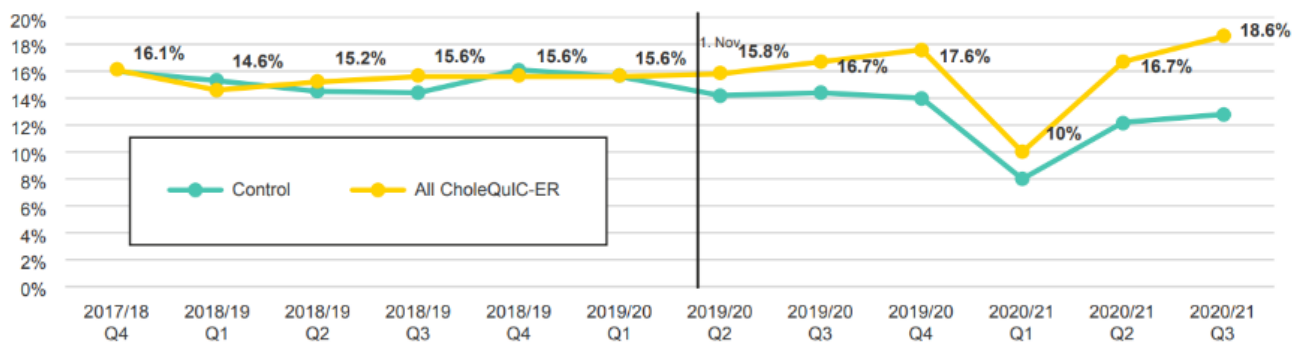
The subscription-based model has been successful thus far. See figures 1 and 2. For more information read the learning report on the webpage [www.rcseng.ac.uk/cholequicer](http://www.rcseng.ac.uk/cholequicer)

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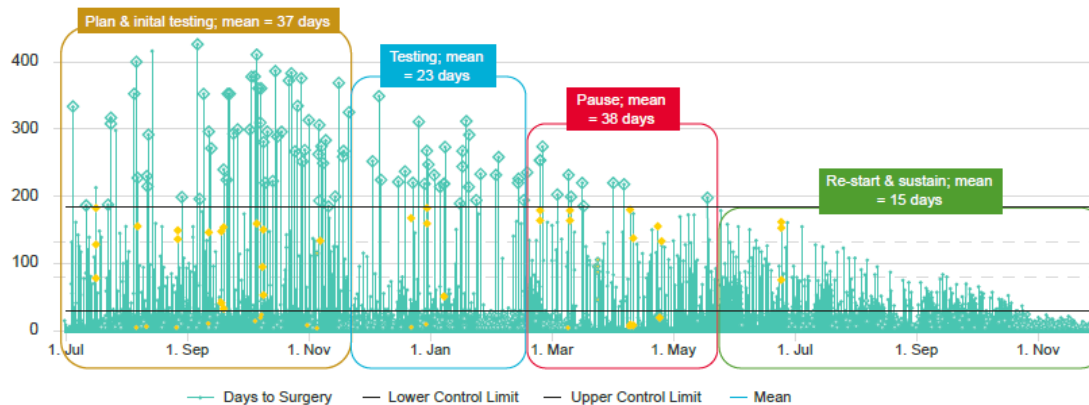
<sup>4</sup> BJS Open, 2019, Effectiveness of a quality improvement collaborative in reducing time to surgery for patients requiring emergency cholecystectomy, <https://bjssjournals.onlinelibrary.wiley.com/doi/full/10.1002/bjs5.50221>

<sup>5</sup> Implementation Science, 2019, Understanding the influences on successful quality improvement in emergency general surgery: learning from the RCS Chole-QulC project, <https://rdcu.be/bPqui>

**Figure 1 : 8-day rate for CholeQuIC-ER sites c.f. controls across England and Wales**



**Figure 2: Time to surgery – Every admission**



Appendix 1 and Appendix 2 include examples of data inputting and charts created from the Chole-quic and Chole-quicker projects.

### Perioperative care of patients with diabetes QI collaborative

The project would use a healthcare QI collaborative approach; defined as a short-term learning approach that brings together a number of teams from hospitals to seek improvement in a focused topic area.<sup>6</sup>

The CholeQuIC-ER subscription-based model has proved to be a successful model that it is possible to replicate to provide a viable approach to deliver a QI collaborative that will focus on improving perioperative care of patients with diabetes working with CPOC.

Combined with QI methodology, the use of a QI collaborative aims to close the gap between potential and actual performance by testing and implementing changes quickly across many groups.<sup>7</sup> Project teams from each hospital will look at the best examples of care. Sharing of learning within the collaborative allows each group to benefit from the successes and failures of others addressing similar issues, reducing duplication of effort and allowing solutions to be reached more rapidly.

QI involves implementing multiple, rapid cycles of change – in response to a specific, predetermined problem - and adapting the approach based on the results seen from each change. This is known as a series of PDSA ('Plan, Do, Study, Act') cycles and has the benefit of allowing solutions to be tailored to the local environment, taking into account the context of the hospital they are being implemented in.

Support from clinical and QI experts was provided by RCS England through coaching sessions, online meetings, webinars, email support, and facilitation of group collaborative meetings.

### Delivery of project

Project team:

- TBC, Interim Clinical Lead for the scoping phase of the project
- TBC, QI Lead(s)
- TBC, Senior Project Manager (Quality Improvement Projects), RCS England.

### Cohort size and eligible sites

All costings are based on at least 20 sites being recruited to the project.

All trusts / health boards undertaking surgery in UK will be eligible to join the project and the project will be work across many specialties.

### Site requirements

The cost per trust or health board to participate to be defined depending on scope of the project but estimated to be £8,000 - £12,000 (plus VAT).

In addition, sites and health boards need to cover any travel and expenses. Each trust or health board should allocate some time in their job plan to the named project lead to lead the project locally. This may be divided if there are co-leads in any location.

### ata collection for Diabetes in Surgery QI Collaborative

The interim clinical lead for the scoping phase will consider options for data collection, including the

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<sup>6</sup> See the Institute of Healthcare Improvement's [Breakthrough Series Collaborative](#) work for more information.

<sup>7</sup> Improvement collaboratives in healthcare, Health Foundation, 2013: <http://www.health.org.uk/publication/improvement-collaboratives-health-care>.

## Diabetes in Surgery QI Collaborative draft proposal

importance of each potential metric and whether such data is collected routinely. The metrics that will demonstrate success will be dependent on the goal.

[See appendix 1](#) for example of Case Capture local database platform used for CholeQuIC-ER.

[See appendix 2](#) for example of REDCap database used for HandsFirst

### Phases and timeline

The proposed timeline below includes a 6 month recruitment period, 18 month programme and a 3 month evaluating and reporting period. Please note these dates are indicative.

Phase name	Month		Activity
1. Scope	1	May-22	Development of project
	2	Jun-22	
	3	Jul-22	Advertise Clinical Lead Role Develop recruitment materials
	4	Aug-22	Promote project with stakeholders Deadline for Clinical Lead Role
	5	Sep-22	Appoint Clinical Lead Role
	6	Oct-22	Faculty meeting 1
2. Initiation: recruitment, payment and set-up	7	Nov-22	Launch formal recruitment
	8	Dec-22	
	9	Jan-23	
	10	Feb-23	
	11	Mar-23	Deadline for sites to apply
	12	Apr-23	Finalise sites Recruit RCS Project Coordinator, QI consultants & Clinical Lead
	13	May-23	Faculty meeting 2
QI Director to review the progress and confirmation of ability to undertake further phases			
3. Set up, launch and testing	1	Jun-23	Faculty meeting 3 <i>Pre-launch meeting</i>
	2	Jul-23	Site support (ongoing)
	3	Aug-23	
	4	Sep-23	<i>Launch meeting</i>
4. Testing improvement ideas in practice	5	Oct-23	Follow-up calls/on-line 1
	6	Nov-23	Site visit
	7	Dec-23	<i>Webinar 1</i>
	8	Jan-24	Follow-up calls/on-line 2  Faculty meeting 4
	9	Feb-24	Site mid-project site reports
	10	Mar-24	<i>Collaborative meeting</i> Follow-up calls/on-line 3
	11	Apr-24	Faculty meeting 5
	12	May-24	Site visit (optional)
5. Demonstrating sustained improvement	13	Jun-24	Faculty meeting 6
	14	Jul-24	Follow-up calls/on-line 4
	15	Aug-24	<i>Webinar 2</i>
	16	Sep-24	Faculty meeting 7

## Diabetes in Surgery QI Collaborative draft proposal

	17	Oct-24	
6. Close and sustainability	18	Nov-24	<i>Final Collaborative meeting</i>
7. Evaluating and reporting	18	Dec-24	Site sustainability reports
	19	Jan-25	
	20	Feb-25	End of project report

### Site recruitment

Recruitment to the project will be promoted via the following channels:

RCS communication channels	External organisations (including Specialty Associations)	Targeted communications
Webpage	Specialty Association Newsletters	Project team's existing contacts
Social media	Specialty Association Webpage	RCS' existing contacts
Newsletters	Specialty Association Agenda items at meetings	Letter to Medical Directors and / or Divisional Director from Clinical Lead
Existing RCS programme of events	Perioperative care network	
RCS Council	Centre for Perioperative Care (CPOC)	
RCS Regional Directors	Royal College of Anaesthetists	
	Royal College of Physicians	

### Suggested bundles or metrics

Below are listed several items to be considered for data collection from the CPOC guide to the management of diabetes in perioperative patients. The interim clinical lead will reduce these down to a useful, pragmatic list. The following tables list:

- A suggested Mini-bundle for each patient
- Suggested diabetes bundle for an individual patient
- Suggested metrics for an organisation

Appendix 3 is a suggested description of roles and responsibilities for a clinical lead in the perioperative management of people with diabetes, that may be used by hospitals/Trusts/Boards on a local basis.



### Suggested Mini bundle for each patient

QI for patients who have diabetes undergoing surgery mini bundle:	
A. Cancellation on day of surgery or within a week before surgery for any reason?	Y/N
B. A diabetes plan written pre-op that is used when in-patient?	Y/N

### Suggested diabetes bundle for an individual patient

Elective patients	Notes
1. If elective patient: Referral including HbA1C within 3 months of referral.	This involves a change in referral practice.
2. If elective patient: If HbA1c over 69mmol/mol (8.5%) patient referred for optimisation	This would need specific local referral pathways (eg referred to diabetes team). Data may need to capture patients referred for pre-assessment, rather than patients undergoing surgery.
3. Given information on: <ul style="list-style-type: none"> <li>Exercise</li> <li>Nutrition and</li> <li>Weight management</li> </ul>	<p>This should be clear. Many units have prehabilitation services or surgery school. Those that do not should have a minimum of giving information. Many patients are not aware of increased risk of surgery with diabetes nor of the options for management.</p> <p>Exercise:  <a href="https://movingmedicine.ac.uk/consultation-guides/condition/adult/periop-in-development/">https://movingmedicine.ac.uk/consultation-guides/condition/adult/periop-in-development/</a></p> <p>Nutrition and weight management:  Referral to a dietician is not sufficient as these services are stretched. Information should be given by the pre-assessment service. For many patients with type 2 Diabetes or obesity, calorie-restriction and low fat diets have been unsuccessful in the past and information on low carbohydrate regimens and/or intermittent fasting should be signposted sensitively:  <a href="https://www.gov.uk/government/publications/sacn-report-lower-carbohydrate-diets-for-type-2-diabetes">https://www.gov.uk/government/publications/sacn-report-lower-carbohydrate-diets-for-type-2-diabetes</a></p>
4. Patient given a plan for medication	This plan should be clearly displayed in notes and available to all members of the Multi-Disciplinary Team (MDT)
5. Day surgery should be the default unless specific procedure or patient factors preclude this.	See National Day Surgery Delivery pack: <a href="https://www.cpoc.org.uk/national-day-surgery-pathway-delivery-pack-published-0">https://www.cpoc.org.uk/national-day-surgery-pathway-delivery-pack-published-0</a>



## Diabetes in Surgery QI Collaborative draft proposal

6. The plan should be used during the admission	
Emergency patients:	
7. Referred to diabetes team or physicians if there is: <ul style="list-style-type: none"> <li>• metabolic derangement</li> <li>• recurrent or severe hypoglycaemia.</li> <li>• persistent hyperglycaemia (two or more consecutive BG values &gt;13mmol/l or hyperglycaemia</li> <li>• with ketone levels &gt;1.5mmol/l</li> </ul>	Clinical lead to define metabolic derangement to be enable measurement
All patients – actions requiring a change of team culture:	
8. The duration of fasting should be minimised. The patient should be first on the list unless there is a clear reason otherwise	
9. Shared Decision Making should be undertaken	
10. CBG measured on admission	
11. CBG measured during operation	For operations over 30 minutes
12. CBG measured and acted upon post-operatively	Blood sugars should be monitored at the very least at these frequencies: <ul style="list-style-type: none"> <li>• on the VRILL: hourly and especially if sedated/ anaesthetised</li> <li>• hourly if on subcutaneous insulin and on day of surgery</li> <li>• minimum of three to four times a day if on subcutaneous insulin and not fasted</li> <li>• minimum of twice a day if only on non-insulin diabetes medication</li> <li>• minimum of once a day if diet and CBG &lt; 10mmol/l.</li> </ul>
13. Blood sugar should be maintained 4-12mmol/l	
14. If Type 1 Diabetes, ensure never denied insulin	Clinical lead to advise on whether data collection is achievable
15. Encourage early DrEaMing (Drinking, Eating and Mobilising)	This is being measured as part of the CQUIN (Commissioning for Quality and Innovation) in England <a href="https://www.gettingitrightfirsttime.co.uk/advice-and-guidance/dreaming-cquin/">https://www.gettingitrightfirsttime.co.uk/advice-and-guidance/dreaming-cquin/</a>
16. Discharge communication with patient and GP – includes the importance self-management.	
17. Length of stay	

### Suggested metrics for an organisation:

FROM: <a href="#">CPOC guideline Recommendations for organisations</a>	Evidence of compliance
Commissioning bodies should work collaboratively with primary, secondary, community and social care services to develop perioperative pathways for people with diabetes. They should consider commissioning preoperative holistic assessment and optimisation (including prehabilitation) services for people with diabetes and co-existing co-morbidities. The focus should be on improving both short-term perioperative outcomes and long-term health outcomes.	
All organisations involved in supporting people with diabetes through the perioperative pathway, should ensure staff have access to and complete regular training in the relevant aspects of diabetes management	
All hospitals, where surgical services are provided, should appoint a clinical lead for perioperative diabetes care. This person should be responsible for developing, implementing, and auditing policies and processes to ensure quality care for all people with diabetes undergoing surgery.	
Hospitals where surgical services are provided, should appoint a specific team to co-ordinate individualised perioperative care for people with diabetes. This task should be supported by perioperative diabetes inpatient specialist nurses (DISNs) with appropriate clinical support.	
Where treatment is provided outside of NHS hospitals, a diabetes specialist team should be available to support the perioperative management of people with diabetes.	
Hospitals should have a strategy to promote and support day surgery for people with diabetes based on British Association of Day Surgery Directory of Procedures.	
Hospitals should promote use of Enhanced Recovery (ER) programmes for all surgical patients, including people with diabetes.	
Hospitals should invest in technologies to support perioperative care of people with diabetes:	
- hospitals should ensure all people with diabetes can be routinely identified on the patient administration electronic systems	
- hospitals should implement system markers and alerts for glucose levels, for example tagging of electronic medical records.	
- hospitals should ensure systems are in place to support self-management for people with diabetes; while waiting for surgery and immediately pre and post-operatively in hospital.	
Hospitals should develop pathways to allow people with diabetes to continue to use their continuous subcutaneous insulin infusions (CSIs) when the anticipated fasting period is only one missed meal.	
There should be clear written information for people with diabetes about what they can do to prepare for surgery and as well as information on the care they can expect around the management of their diabetes in the perioperative period and their involvement in their care.	
The importance of the administrative and medical secretariat support should be recognised and should be actively involved in the coordination and communication of perioperative pathways (this includes recording and coding of personal information).	

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## Diabetes in Surgery QI Collaborative draft proposal

### Appendix 1 Case capture database Input page

Once the record is complete and saved you can lock it. Once the record is locked you will be unable to edit the record further but will still be able to view it.

Site: **Netsolving.**

Complete Incomplete Errors Not saved

CholeQuIC-ER

CholeQuIC-ER

1. Patient hospital number

?

2. Date of emergency admission

?

3. Cholecystectomy decision

☐ Fit and Consenting for cholecystectomy - as inpatient

☐ Fit & Consenting for cholecystectomy - discharged before surgery

☐ CBD stones Present

☐ Temporarily not fit (e.g. pregnancy, patient choice)

☐ Permanently not fit (e.g. comorbidities)

☐ Not a gallstone admission (e.g. no gallstones)

Save

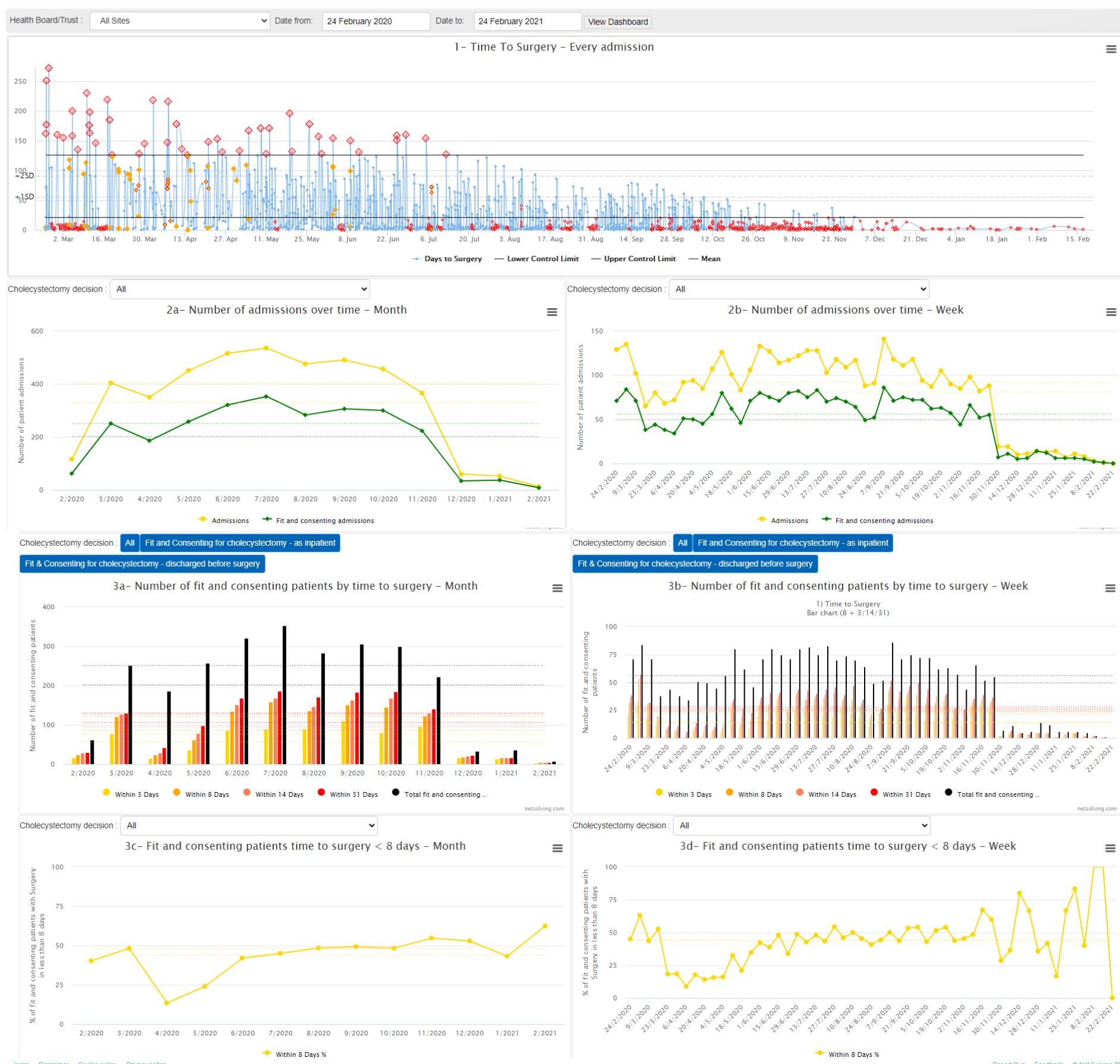
Exit

4. Cholecystectomy date

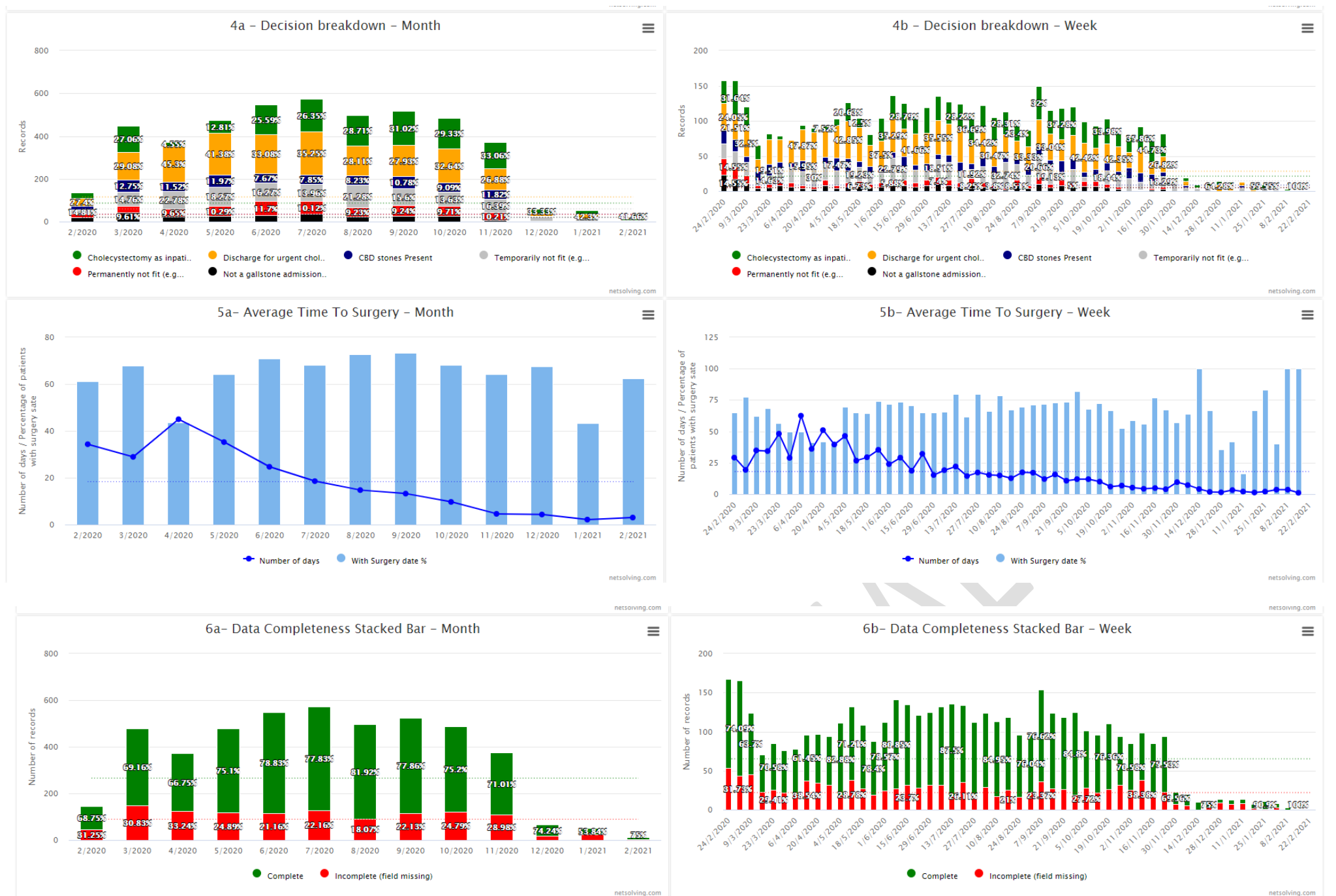
☐ N/A

?


### Output page (dashboards)



## Diabetes in Surgery QI Collaborative draft proposal



## Appendix 2 REDCap database Input page



Logged in as **smacsween** | [Log out](#)

[My Projects](#) or [Control Center](#)

[REDCap Messenger](#)

View project as user: -- select a user --

**Project Home and Design**

[Project Home](#) · [Project Setup](#)

[Designer](#) · [Dictionary](#) · [Codebook](#)

Project status: **Production**

**Data Collection**

[Record Status Dashboard](#)

[Add / Edit Records](#)

[Record ID 15](#) [Select other record](#)

Data Collection Instruments:

**HandsFirst**

**Applications**

[Project Dashboards](#)

[Alerts & Notifications](#)

[Multi-Language Management](#)

[Calendar](#)

[Data Exports, Reports, and Stats](#)

[Data Import Tool](#)

[Data Comparison Tool](#)

[Logging and Email Logging](#)

[Field Comment Log](#)

[File Repository](#)

[User Rights and DAGs](#)

[Customize & Manage Locking/E-signatures](#)

[Data Quality](#)

[API and API Playground](#)

[REDCap Mobile App](#)

**Project Dashboards** [Add/Edit](#)

[Test](#)

[test data](#)

[test 2](#)

**Reports** [Search](#) [Organize](#) [Edit](#)

[betsi](#)

[Hull data](#)

[Mark's Trusts](#)

### HandsFirst QI Collaborative PID 16

Actions: [Download PDF of instrument\(s\)](#) [Share instrument in the Library](#) [Video: Basic data entry](#)

**HandsFirst**

Assign record to a Data Access Group? -- select a group --

Adding new Record ID 15.

**Record ID** 15

**Hospital number**

**Age (N.B. Standards may differ for children and adults)**  
\* must provide value

**Date and time of injury**  
\* must provide value

**Date and time of first coming to any form of medical attention such as an Emergency Department**  
\* must provide value

**Date and time of decision to treat operatively**  
\* must provide value

**Date and time of start of operation**  
\* must provide value

**Operation title**

**Hospital site where operation took place**

**Mechanism of injury**  
\* must provide value

**Category of injury**  
\* must provide value

**Anaesthetic**  
\* must provide value

**Level of sterile draping used**  
\* must provide value

**Location of procedure**  
\* must provide value

**Grade of primary surgeon performing the procedure (see next question for supervision)**

[Save & Continue](#)

[Save & Exit](#)

[Cancel](#)



### Appendix 3: Suggested role description for local use by each hospital/Trust/Board who should appoint a clinical lead for perioperative care:

Roles and responsibilities for the clinical lead for perioperative diabetes care in ... hospital/Trust/Board

The clinical lead should:

- work with clinical leads at other hospitals/Trusts/Boards to share policies and best practice between sites
- establish and lead a multidisciplinary team including at minimum: a patient representative, diabetes specialist, anaesthetist, surgeon, geriatrician, nurse, pharmacist, allied health professional, preoperative assessment team member, community representation (general practitioner, community diabetes team member) and manager from perioperative services
- work with the MDT to develop and disseminate local policies and procedures for perioperative management of people with diabetes to include those listed below
- establish a local quality improvement programme based on these recommendations, linking with listing datasets (NADIA, PQIP) and report the outcomes regularly to the board.
- ensure the following policies, procedures and guidelines (supported through training resources) are available and accessible to, and implemented by, all healthcare professionals involved in the care of people with diabetes undergoing surgery:
  - a policy outlining day surgery in people with diabetes (noting diabetes is not a reason to deny ambulatory surgery)
  - a policy promoting admission on day of surgery in people with diabetes (noting diabetes specific pre-admission should be avoided)
  - establishment of Enhanced Recovery Programmes in people with diabetes (noting same principles for people with diabetes as those without diabetes)
  - indications for involvement of the diabetes multidisciplinary team, including diabetes specialist nurse
  - identification of high-risk people with diabetes, including those with Type 1 diabetes and emergency admissions, to ensure individualised care plans are proactively instituted
  - a guideline on perioperative management of diabetes medication
  - a guideline on indications for and use of variable rate intravenous insulin infusion
  - a guideline on perioperative management of patients on continuous subcutaneous insulin infusions/ pump therapy and/or with continuous and flash glucose monitoring devices
  - a policy to support reduction of the risk of medication errors (including timely medicine reconciliation)
  - a policy describing strategies to reduce the risk of and harm related to hospital acquired hypoglycaemia and hospital acquired diabetic keto-acidosis (DKA)
  - a strategy to avoid late cancellation of surgery and to ensure a root cause analysis of late cancellations in people with diabetes
  - a policy to support safe and effective discharge from hospital, communicating with community services.

The clinical lead and MDT should ensure consistent availability of monitoring equipment and appropriate medications.

- All areas including every theatre to have immediate access to glucose meters
- All clinical areas to have access to ketone meters
- All places in the hospital where people with diabetes are managed should have access to treatment for hypoglycaemia, looming hypoglycaemia and hyperglycaemia. This includes access to insulin syringes and vials of rapid acting insulin analogue preparation and 20% glucose.

The clinical lead and MDT should work with people with diabetes to:

- co-design, co-develop and disseminate patient information leaflets to include:
  - what people with diabetes can expect during surgery in relation to diabetes management
  - what medication changes and target levels are necessary preoperatively
  - promote the importance of and practical advice on preoperative and postoperative lifestyle modification
  - promote patient self-management of diabetes during admission with signposting to supportive services (see JBDS. Self management of diabetes in hospital) <https://abcd.care/resource/jbds-04-self-management-diabetes-hospital>





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