Implementing a New Diabetic Algorithm for Ophthalmology Day Surgery Patients at the Royal Alexandra Hospital (RAH)

Presentation PDF

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DEFINE OPPORTUNITY

Background :
The Ophthalmology Day Surgery Service at the RAH serves upwards of 25 patients/day of which 3-4 patients are diabetic on insulin. Patients with diabetes mellitus scheduled for eye surgery are tested for glucose levels on the morning of surgery. They are instructed to withhold oral hypoglycemic medication on the day of surgery. Pre-op diabetic patients receive insulin infusion protocols as part of the regular glucose control for diabetic patients at the RAH.

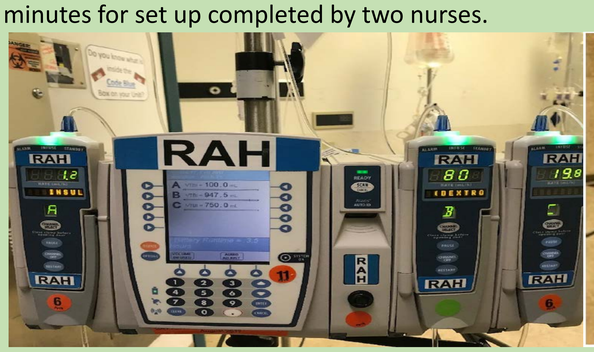
Problem:
Insulin infusion protocols may compromise patient safety and increase the diabetic patient's pre-op preparation time resulting in operating room delays that are costly. Until our new algorithm, all diabetic ophthalmology day surgery patients (average of 80 diabetic patients a month) received intravenous insulin infusion protocols as part of the regular glucose control at the RAH. This resulted in hypoglycemic events. Using a pre-op insulin protocol required on-site nursing interaction, and more material supplies; it also caused higher adverse events related to calculations and imputing the correct dosage of Insulin.

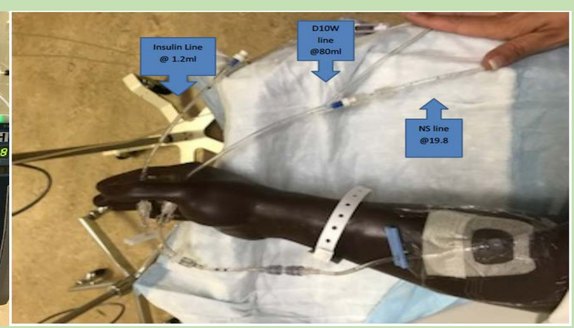
Goal:
Develop and implement a new diabetic algorithm to decrease the diabetic patient's pre-op preparation time while improving safety.

BUILD UNDERSTANDING

A multidisciplinary project team was assembled including Ophthalmologists, Endocrinologists, Anesthesiologists, Professional practice, Management and Nurses. Results from a literature review provided strong evidence that the insulin pump increased hypoglycemic events. A cost benefit analysis suggested that replacing the pre-op insulin protocol with a new algorithm could save money for our Department.
Leveraging best practices from literature, the team brainstormed a new algorithm to safely treat diabetic patients prior to eye surgery. The new algorithm utilizes the insulin protocol only when blood glucose is higher then 20 mmol/L. The team also developed and implemented a real-time tracking tool to support the new algorithm that collected information (process-protocol use and outcome measures-adverse events reduction) regarding the effectiveness of the new protocol.

Baseline data: August 2016- July 2017 there were **13 RLS** reports filed regarding the previous diabetic protocol being used on the ophthalmology . Majority of these reports were problems related to the initial set up of the protocol and how the protocol was handled incorrectly in the OR. Multiple hypoglycemic incidents were documented related to this protocol. This diabetic protocol required approximately 30 minutes for set up completed by two nurses.





MANAGE CHANGE

Alberta Health Services

EYE INSTITUTE OF ALBERTA

Memorandum

Date:	July 31, 2017
To:	Ophthalmology Physician Group; Ophthalmology Resident Group
cc:	Dr. Karim Damji, Chief/Chair of Ophthalmology Department Dr. Keith Drader, Anesthesiology Dr. Rany Al-Agha, Internal Medicine Dr. Kevin Gregg, Anesthesiology Kim Kostuk, Executive Director, Ambulatory Care, Emergency, Endoscopy & Ophthalmology Bonnie Klasick, PCM, GOR Ophthalmology/Otolaryngology/Adult Day Surgery/Preadmission Jennifer Brouwer, Manager - Inner City Health & Wellness Program & Professional Practice Karen Harris, PCM Ophthalmology
From:	Hilary Salmonson, Unit Manager Unit 22- Ophthalmology, RAH
RE:	New Diabetic Algorithm for Ophthalmology Day Surgery Patients

Dear Physicians:

Starting August 1, 2017 we will be implementing a new diabetic algorithm to treat our Ophthalmology Day Surgery patients on Unit 22.

Changing to this new diabetic algorithm will decrease the patients pre-op preparation time, will improve their patient experience and will prevent errors from occurring with management of our diabetic patients by reducing the number of patients receiving insulin drips on the day of their surgery.

Stakeholders including Internal Medicine, Anesthesia, Professional Practice, our Ophthalmology Physician group and Management have invested their time and have been dedicated to supporting this change to allow us to improve the care provided to our diabetic patients.

We will also be implementing a tracking tool with the new algorithm that will collect information regarding how effective the new algorithm has been. The nursing staff on Unit 22 will gather data about the patient's diabetic journey during their stay on Unit 22.

Please share this memo with your teams.
If you have any concerns, questions or feedback please feel free to contact me.

Hilary Salmonson
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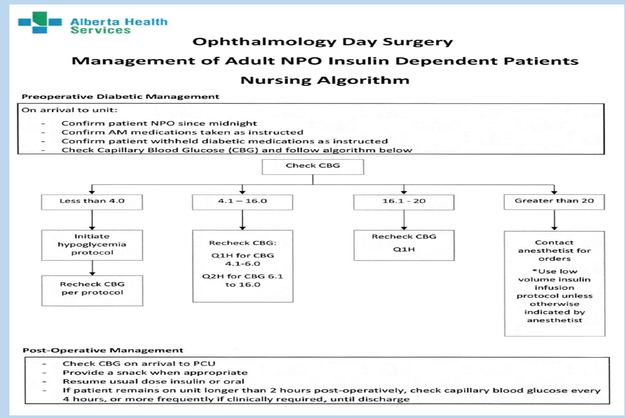

Alberta Health Services

Ophthalmology Day Surgery
Management of Adult NPO Insulin Dependent Patients
Nursing Algorithm

Preoperative Diabetic Management

On arrival to unit:
- Confirm patient NPO since midnight
- Confirm AM medications taken as instructed
- Confirm patient withheld diabetic medications as instructed
- Check Capillary Blood Glucose (CBG) and follow algorithm below

Check CBG

Less than 4.0	4.1 – 16.0	16.1 - 20	Greater than 20
Initiate hypoglycemia protocol Recheck CBG per protocol	Recheck CBG: Q1H for CBG 4.1-6.0 Q2H for CBG 6.1 to 16.0	Recheck CBG Q1H	Contact anesthetist for orders *Use low volume insulin infusion protocol unless otherwise indicated by anesthetist

Post-Operative Management
- Check CBG on arrival to PCU
- Provide a snack when appropriate
- Resume usual dose insulin or oral
- If patient remains on unit longer than 2 hours post-operatively, check capillary blood glucose every 4 hours, or more frequently if clinically required, until discharge

ACT TO IMPROVE

PDSA Timeframe: New Diabetic Algorithm implemented on August 1, 2017

Results:

- August 1, 2017 to July 31, 2018 there have been **zero RLS** reports submitted related to the diabetic algorithm. No reports of pre-op or post-op hyper/hypo glycemic events were reported through the RLS system.
- Post PDSA data shows that an average of 2 (2.5%) diabetic patients a month needed the previous insulin protocol after implementing the new algorithm which decreased from 100%, thus decreasing the cost and the error rate. This innovation will be shared throughout the hospital, other hospitals and the province.
- Reduction in nurses set up time: The new diabetic algorithm takes approximately 7 minutes to initiate and can be successfully set up by one nurse.

SUSTAIN RESULTS

Measurement Plan: August 1, 2018, data collection and analysis. The Ophthalmology team continues to enter and analysis the data every few months.

Results shared at the Ophthalmology Department and quality council meetings.
The algorithm will be updated to improve quality and outcomes as needed.

Zero RLS reports submitted related to diabetic algorithm August and September 2018.

SHARE LEARNING

Lessons learnt:
The new diabetic algorithm real-time tracking tool to measure ongoing utilization and effectiveness proved challenging. The core improvement team championing this test of change was vital to making this initiative a priority within the hospital ophthalmology surgery unit. Improving patient safety and hospital experience, as well as provider experience, were key motivating factors to successful innovation development and implementation.

Approximately 1000 diabetic patient on insulin attend the Ophthalmology Day Surgery Service at the RAH every year of which around 25 patients/year may require the insulin pump after implementing the the new Diabetic Algorithm.

Retina Surgeon Quote: *"It has works out very well. Thanks"*

Anesthesiologist Quote: *" I'm very happy with the new nursing algorithm for ophtho day surgery patients. It is straightforward, shows common sense and is a huge improvement in patient safety for our diabetic patients."*

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