

Tell us about your idea/project:

The MASTER Class Online eLearning Project will improve the diabetes care of children and families at RNSH, by creating an adaptive, targeted online eLearning platform based on the specific needs of each individual allowing patients and families to access tailored education from their own home, in their own time.

Type 1 diabetes requires lifelong insulin therapy to prevent life-threatening complications and early death. The RNSH Paediatric Endocrine Department provides multidisciplinary care to over 200 patients, educating children and families on how to make numerous treatment decisions on a daily basis, guided by glucose levels. In the past, they could only be checked using painful fingerpicks approximately 6 times per day. Technological advances now permit Continuous Glucose Monitoring (CGM) which measures glucose levels 288 times per day. Access to this technology was limited by cost, but following the recent introduction of a federal government subsidy we have commenced over 180 patients on CGM in the past 15 months in a preliminary project (SENSORS Study), through face to face hospital visits.

Assessing this process, we found that patient expectations were high, and were largely met, and that diabetes control improved in the short term. However, there were very substantial time requirements from staff (manuscript submitted). Patients and families also reported that it is impractical to attend hospital for education, and participants of education groups have varying speeds and styles of learning. As requested by patients, there is now a pressing need for families to understand how to use the Advanced Features of CGM technology, and for this education to be able to be provided in a sustainable, time efficient, cost-effective, user-friendly manner, adapted to the needs of individual learners. This eLearning tool could also potentially be adapted and expanded to adult diabetes services, and in the education of medical and nursing staff.

Provide a case for change:

With increased uptake of CGM use and rapid advances in diabetes technology there are several looming problems:

1. Need for patient and family education in Advanced Sensor Technologies:

Patients and families require knowledge, skill and confidence to make appropriate decisions when faced with what could otherwise be an overwhelming amount of information from CGM. Without this education they may:

- make poor decisions when interpreting CGM data, resulting in deteriorating diabetes control.
- have increased anxiety when faced with CGM data.
- fail to make the most use of the Advanced Features, and lose the opportunity to prevent lifelong diabetes complications, and impair day-to-day quality of life.

Some real life examples of current problems we have observed include:

- Poorly informed patients and families have inappropriately awoken and fed their children overnight by misinterpreting the CGM information, leading to disrupted sleep for all, and worsening of the child's diabetes control.
- Parents of children attending daycare and school have been ill-equipped to inform staff caring for their children about how to react to the CGM information, impairing their diabetes control and potentially child development.

2. Dramatically increasing requirements in staff time for education:

In our previous project, we identified that there was an additional 7.7hrs per patient per year of staff time required when introducing patients to the basics of CGM. This staff resource requirement will further increase when patients and families are introduced to Advanced CGM Functions, and may exceed the existing capacity of the department, unless an efficient, efficacious and systematic program is introduced.

3. Need for targeted online eLearning platform:

- Patients have reported difficulty attending hospital based training sessions.
- The online eLearning platform would allow patients to complete the education modules at their own pace, repeating sections of need.

Please list how you will implement the project:

TIMELINE OF KEY STEPS:

Already completed:

- Consultation with patients and families regarding expectations and outcomes with introductory CGM training.
- Assessment of short term CGM outcomes following introductory education.

Completion by November 2018:

- Community consultation with Patients and Families regarding their preferences for education in the MASTER Class Online eLearning Project.

February 2019: Commencement of a Pilot Face-To-Face Program

- Creation of educational resources for MASTER Class face to face education.
- Commencement of MASTER Class face to Face sessions including assessment of baseline knowledge, confidence and diabetes control data from first 12 weeks of program.

Completion May 2019:

- Analysis of baseline data pre-MASTER Class face to face education.

Completion August 2019:

- Analysis of follow-up data post-MASTER Class face to face education.

Completion November 2019:

- Development of targeted educational MASTER Class eLearning software platform based on the results of previous face to face sessions for subsequent ongoing clinical use

PERSONNEL Involved in the project:

LEADS: Lena Lim (Paediatric Diabetes Educator), Dr Shihab Hameed (Paediatric Endocrinologist),

Sharon Youde (Paediatric Dietitian and Head of Department).

Other Project Members:

Paediatric Diabetes Educators:

Ailsa Marshall, Tanya Chiu

Paediatric Endocrinologists:

Dr Ohn Nyunt, Dr Helen Woodhead, Dr Kim Ramjan, A/Prof Michelle Jack

Dr Sally-Anne Duke Endocrinologist for Transition/Young Adult Diabetes

Allied Health:

How will you measure/evaluate your project:**OUTCOMES:**

1. Diabetes control pre and post education. This data is routinely collected at clinic visits as part of standard diabetes care and includes: HbA1c, CGM data including time in range, standard deviation of glucose values, number and severity of hypoglycaemic episodes, time spent using CGM.
2. Confidence, competence and knowledge with Advanced Sensor functions pre and post education. This will be assessed using a short questionnaire in a similar manner to our previous CGM study.
3. Comparison of baseline and follow-up diabetes control, competence, confidence and knowledge data. This will allow participants to be stratified according to baseline levels of knowledge and confidence and comparisons made to outcomes following education.
4. Creation of a targeted educational software platform for subsequent ongoing clinical use.
5. Ongoing community consultation with the software platform to ensure the needs and expectations of patients and families continue to be met.

Detail the cost:

Total cost:	\$38, 509.78
Breakdown of seeding support:	
Educational resources:	\$250
Computer screens:	\$250 x 4 = \$1, 000
Incentive Reward/Catering for Participants:	\$20 x 180 = \$3, 600
IT software design for eLearning modules:	\$8, 000 x 4 modules = \$32, 000
CNC2 costs x25 hours + on-costs (15.59%)	
(required for development of education modules)	\$1, 659.78

NB: This innovative program requires seeding support only, and will then be a self-sustaining program.

Additional comments/references:

-To our knowledge, this innovative program is the first of its kind.

-The treatment decisions made by patients and families prevent severe hypoglycaemia, and long term diabetes complications which are estimated to cost in excess of 14.6 billion dollars annually in Australia (Lee CMY et al. Diabetes Research and clinical Practice. 99; (3) 2013). Hence effective education is of paramount importance in this condition, and of lifelong benefit to the patient, their family and the broader community.

- eLearning modules would substantially reduce the number of hours of staff time needed compared with group education, which could then be put to other aspects of diabetes care in the department

Hence, if we do not implement The MASTER Class Online eLearning Project, patients and families are at great risk of becoming more anxious about their diabetes management, and missing out on the opportunity to use this technology to proactively reduce diabetes complications and improve confidence and quality of life. Further to this, there will be an unsustainable increase in staff time requirements for repetitive group education. In summary, The MASTER Class Online eLearning Project, will provide tailored, patient-centred care to improve the lives of patients and families at RNSH. This project is in keeping with the NSLHD's CORE values of collaboration, openness, respect and empowerment. Furthermore, The MASTER Class Online eLearning Project addresses the 2017-2022 draft strategic plan focus on technology to deliver better clinical and operational performance. It also complements all four of the strategies and themes of that strategic plan, including Healthy Communities, Connected Person-Centred Care, Evidence-Based Decision Making, Responsive and Adaptable Organisation and having an Engaged and Empowered Workforce.