

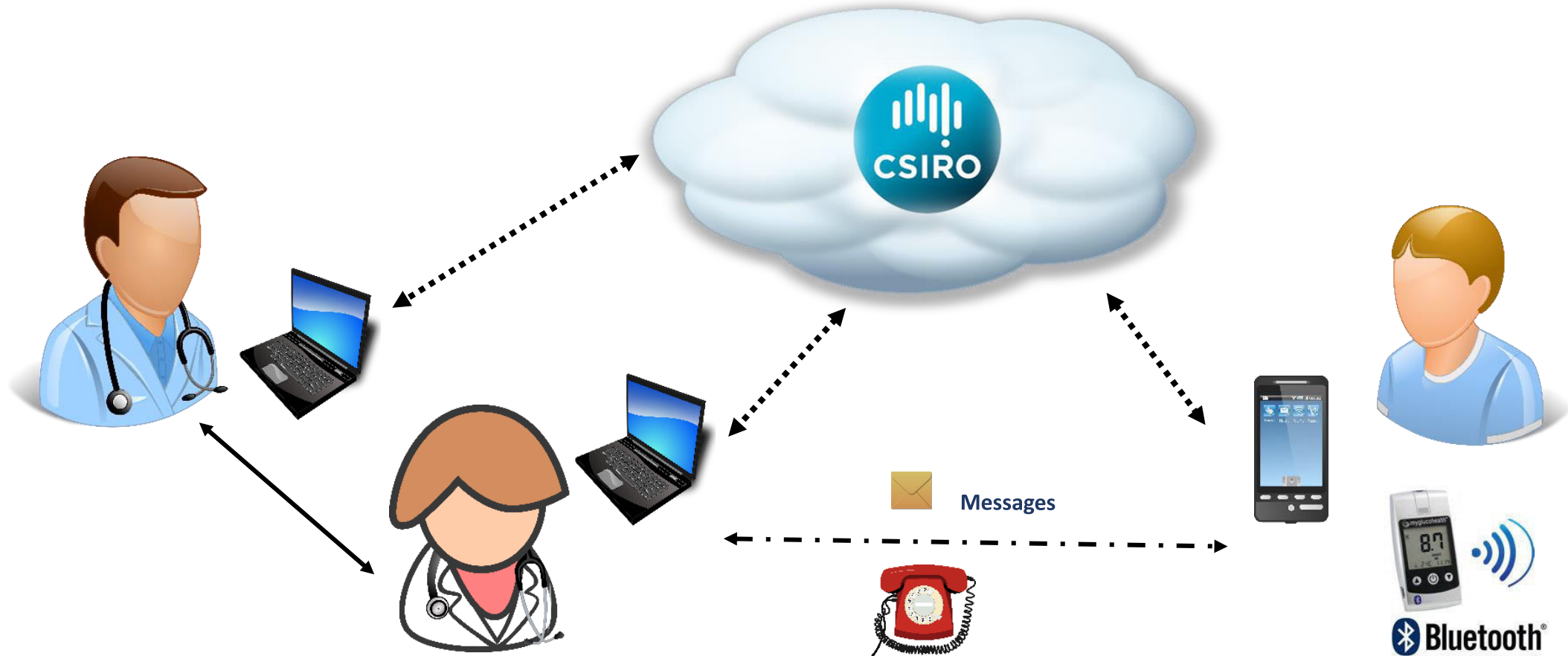
Mobile Diabetes Monitoring System (MDMS)

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App for Insulin Dose Adjustment

- Improve the efficiency of the IDA service
- Reduce transcription errors
- Potentially cost saving

Mobile Diabetes Monitoring system (MDMS)



Bluetooth Glucose Meter





Diabetes app- (iOS Version)

Carrier 9:40 AM

Test Patient

Today

Prescription

Levemir FlexPen

Before Breakfast	Before Lunch	Before Dinner	Before Bed
5.0	15.0	18.0	22.0

Protaphane

Before Breakfast	Before Lunch	Before Dinner	Before Bed
2.2	1.2	3.2	1.2

Check for new Prescriptions

Measurements

- Enter my Blood Glucose
- Enter my Insulin Dose
- Take Blood Glucose Reading

Messages

Reminder: we have an appointment at 10:30 on Wednesday the 5th.

Home Graphs Daily Entries Table

Carrier 9:41 AM

Test Patient

Wed, 1 Jun 2016

Humulin 30/70

6 units Before breakfast

6:15 AM

Blood Glucose

3.2 mmol/l Before breakfast

6:15 AM

Blood Glucose

4.5 mmol/l After breakfast

7:15 AM

Home Graphs Daily Entries Table

Carrier 9:41 AM

Test Patient

Daily BGL (past 60 days)

Average 4 Maximum 5

Time	Blood Glucose (mmol/l)
6:00	3.2
6:15	3.2
6:30	4.5
7:15	5.2
12:00	5.0
12:15	1.5
18:00	4.2
18:15	5.2
21:00	4.0

BGL vs Time Of Meals (past 60 days)

Time	Blood Glucose (mmol/l)
BB	3.2
AB	4.5
BL	1.5
AL	5.0
BD	4.2
AD	5.2
BBed	4.0

BGL Distribution (past 60 days)

11 11

Home Graphs Daily Entries Table

← PAH ISS

Tester Android Anishz

📄 Diabetes Data

🚶 Medications

✉ Message History

✉ Email Report

? User Guide

🔧 Settings

27 Feb 2017 4:45:09 pm
Test
Version: 2.5.0

16 Mar 2017 1:51:34 am
Test

22 Apr 2017 4:54:44 pm
Scenario AM



Reinforcement

- Decision support
 - Computer generated text messages
- Based on blood glucose levels & frequency of tests
- Messages have links to information on websites – Diabetes Australia & Diabetes Queensland
- Can opt out or opt in as and when required

Date	Alert Type	Message	Cleared?	Message Sent?
04 Jun 2017	BGL Test Count	Blood glucose checks were less than once daily. More regular checks can help your diabetes management. Any problem? Talk to your diabetes team	Clear Alert	No
28 May 2017	BGL Test Count	Check blood glucose as recommended by your diabetes team http://bit.ly/2nqHtzO . Know how your lifestyle choices and medication are making a difference	N/A	Yes
27 May 2017	BGL Level - Hyperglycaemia	2 blood glucose levels higher than 25 in the past 7 days. If you need advice, call GP or your diabetes team at PA Hospital on 31761060 during working hours	Clear Alert	Yes
24 May 2017	BGL Level - Hyperglycaemia	Great- blood glucose within range! You are reducing your risk of diabetes related complications be it related to the eye, kidney, feet or heart attack	N/A	Yes
21 May 2017	BGL Test Count	Check blood glucose(BGL) as recommended-better understand how physical activity, diet & lifestyle changes such as travel, stress and illness affect your BGL	N/A	Yes
May 2017	BGL Level - Hyperglycaemia	1 or more blood glucose were high this week. Improving blood glucose can decrease your risk of heart disease- see diabetesaustralia.com.au/heart-disease	N/A	Yes
May 2017	BGL Test Count	Blood glucose checks were less than once daily. More regular checks can help your diabetes management. Any problem? Talk to your diabetes team	Clear Alert	Yes
May 2017	BGL Test Count	Develop confidence in looking after your diabetes. Check your blood glucose as recommended by your diabetes team http://bit.ly/2nqHtzO . Keep going	N/A	Yes
May 2017	BGL Level - Hyperglycaemia	2 blood glucose levels higher than 25 in the past 7 days. If you need advice, call GP or your diabetes team at PA Hospital on 31761060 during working hours	Yes	Yes
May 2017	BGL Level - Hypoglycaemia	You had blood glucose levels below 4. Do you have a plan to deal with these 'hypos' quickly? diabetesaustralia.com.au/hypoglycaemia	N/A	Yes
May 2017	BGL Level - Hyperglycaemia	1 or more blood glucose(BG) were high this week. If you don't know why think about how stress, food, physical activity and medication affect your BG	N/A	Yes
May 2017	BGL Level - Hyperglycaemia	Well done! You are testing blood glucose at least 3 times a day. Self-monitoring has helped people with diabetes better manage their condition	N/A	Yes
May 2017	BGL Test Count	Blood glucose checks were less than once daily. More regular checks can help your diabetes management. Any problem? Talk to your diabetes team	Clear Alert	Yes

Clinician Dashboard - Summary page








MoTER

[Home](#)[New Consumer](#)

Anish Menon

ALL

Find consumer

Consumer	Care Program
  Farhad, iOS Dob: 28 August 1980 (36) Sex: Male	Start Date: 05 August 2016 Last contact: 22 April 2017 Discharge: - No. BGL <= 4 = 0 No. BGL 4 - 10 = 0 No. BGL > 10 - 16 = 0 No. BGL > 16 = 0 9 Red Alerts!
  Android Anish2, Tester Dob: 05 December 2016 (0) Sex: Female	Start Date: 05 December 2016 Last contact: 22 April 2017 Discharge: - No. BGL <= 4 = 0 No. BGL 4 - 10 = 0 No. BGL > 10 - 16 = 0 No. BGL > 16 = 0 7 Red Alerts!
  AndroidAnish4, Test Dob: 05 December 2016 (0) Sex: Male	Start Date: 06 December 2016 Last contact: 22 April 2017 Discharge: - No. BGL <= 4 = 0 No. BGL 4 - 10 = 0 No. BGL > 10 - 16 = 0 No. BGL > 16 = 0 7 Red Alerts! No SMS


CLINICIAN DASHBOARD

Add/Change Insulin	<p>Insulin dose change needed <input type="checkbox"/></p> <p>Dose 1</p> <p>Insulin <input type="text" value="Choose One"/></p> <p>Before BFast <input type="text"/></p> <p>Before Lunch <input type="text"/></p> <p>Before Dinner <input type="text"/></p> <p>Before Bed <input type="text"/></p> <p>Dose 2</p> <p>Insulin <input type="text"/></p> <p>Before BFast <input type="text"/></p> <p>Before Lunch <input type="text"/></p> <p>Before Dinner <input type="text"/></p> <p>Before Bed <input type="text"/></p>
Other Medications	<p>Metformin <input type="checkbox"/></p> <p>Sulfonylurea <input type="checkbox"/></p> <p>DPP IV Inhibitor <input type="checkbox"/></p> <p>SGLT2 Inhibitor <input type="checkbox"/></p> <p>GLP1 Agonist <input type="checkbox"/></p>
Additional Medications	<p> </p>
Next ISS Contact	<p>Next ISS contact with this patient on <input type="text" value="17"/> </p> <p>Discharge</p>
Other Actions	<p><input type="checkbox"/> Arrange clinic review <input type="text" value="17"/> </p> <p><input type="checkbox"/> Endocrinologist review <input type="text" value="17"/> </p> <p><input type="checkbox"/> see GP <input type="text" value="17"/> </p> <p><input type="checkbox"/> Arrange script with GP <input type="text" value="17"/> </p> <p><input type="checkbox"/> Arrange script from clinic <input type="text" value="17"/> </p> <p></p>
Send Message to the patient	<p>Send message via: <input type="text" value="Phone Application"/></p>

Telemedicine and e-Health, Vol. 24, No. 7 | Original Research

 Full Access

 Figures

 References

 Related

 Details

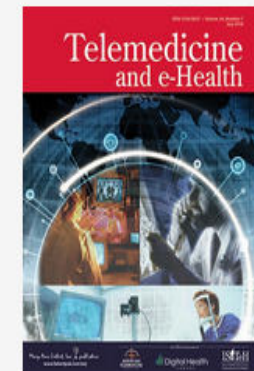
User Experience of an Innovative Mobile Health Program to Assist in Insulin Dose Adjustment: Outcomes of a Proof-Of-Concept Trial

Hang Ding , Farhad Fatehi, Anthony W. Russell, Mohan Karunanithi, Anish Menon, Dominique Bird, and Leonard C. Gray

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 Tools  Share



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Information

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Current/Future trials

- REMODEL: Urban pilot RCT of 44 T2DM using MDMS/Patient portal for 12 months – 6 months follow-up completed recently
- REMODEL: Community & regional pilot RCT for insulin dose adjustment – planned
- Integration with Primary care : incorporating algorithms for insulin dose adjustment and medication changes

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DIABETES QUEENSLAND



NHMRC CENTRE FOR RESEARCH
EXCELLENCE IN TELEHEALTH



ROCHE AUSTRALIA

Study Design: Proof of Concept

- Setting: PAH Outpatient Diabetes Clinic
- Participants: T2DM Patients already stabilised on insulin
- Sample size: 10
- Intervention: Using MDMS
- Duration: one week

Results

- 9 patients, age: 58 ± 14 y/o
- On average: 3 BGLs per day
- High acceptance (4.2 / 5)
- Preferred to continue (4.2 / 5)
- Confident (4.3 / 5)
- Satisfied (4.3 / 5)

Patients' Feedback

- Generally satisfied with the system 😊
- Unreliable glucose meter 😞
- Some problem with manual data input 😞
- Problems with Bluetooth connectivity 😞

Challenges

- Technical
 - Compatibility with different mobile phones
 - Internet connectivity at patients' home
 - Bluetooth connectivity
- Organisational
 - Integration with current model of care
 - Training of staff