An Investigation into the Role for a Pervasive Technology Solution to Support Gestational Diabetes Self-Care

BY

NILMINI WICKRAMASINGHE
STEPHEN COLE
RAJ GURURAJAN
LEN KLIMAN
JOHN ZELCER
STEVE GOLDBERG

NILMINI.WORK@GMAIL.COM

This study was made possible due to funding from: Epworth HealthCare and a Schoeller Senior Fellowship
Agenda

• GDM
• Why Mobile
• The DiaMonD Solution
• Results to Date
• Closing Thoughts

“This is where the idea for the new EMR starts getting a little complicated.”
GDM: How To Meet A Growing Demand At Fixed Resource Levels

Gestational Diabetes Rates

Growing # of Patients
- Change in diagnostic criteria 30-50% increase

Improve Quality of Care
- Increase Efficiencies


© Nilmini Wickramasinghe 2015
Why mobile?

- Penetration of mobile phones.
- Pervasive thus anywhere, anytime, anyone.
- No/low learning curve.
- Convenient for age group.
The Journey

- Problem
- Good Idea
- Systematic and rigorous processes to reach realisation of the idea
Chronic Disease Management Model

Health System

CIS
OSD
DSS
SMS

Community
Resources & Policies

Informed & active patient
Prepared & proactive practice team

Improved Outcomes

© Nilmini Wickramasinghe 2015
Actualizing The Model

A Wireless Diabetes Program

Knowledge-base Systems Development Mode$

© Nilmini Wickramasinghe 2015
The Solution in a Nutshell

**INET Wireless Diabetes Program**
**Diabetes Care Centre, Credit Valley Hospital**

Prevent Diabetes Related Complications with Better Control of Glycemic Levels, Measured by HA1C

Diabetes Management System (Bayer WinGlucofacts & INET Sync)

- **Clinician**
- **People w/Diabetes**
- **GlycemiCare Server**
- **Patient Privacy: No identifiable information is transmitted.**

Action Request i.e. “Keep up the good work”

Enter Sugar Level

Receive Sugar Levels

Send Action Request

© Nilmini Wickramasinghe 2015
Screen Shot

Screen Shot from the Application – Clinician view

Unique ID

Doc ID

Specific messages
Revised Systems Development Life Cycle

Refocus 1 to 5 year systems development life cycle into small manageable pieces

Physician-led Disease Management Projects

Traditional 1 to 5 Year Systems Development Life Cycle Project

Measurable Benefits

© Goldberg 2003, 2004, 2005

© Nilmini Wickramasinghe 2015
Inet Delivery Framework

Physician-led Chronic Disease Management Project

INET Delivery Framework

Scope
Localize
Field
Evaluate

Create, Implement and/or Enhance a Chronic Disease Management / Prevention Program

(Adapted from Wickramasinghe and Goldberg, 2006)

© Nilmini Wickramasinghe 2015
Financially Sustain Improved Outcomes
Inet Business Model

Physician-led Chronic Disease Management Project

- Medical Informatics
- E-Health
- Business Management
- Information & Comm. Tech

People
- Patient
- Community/Home Care
- Primary Care
- Acute Care
- Medical Compliance
- Administration
- Information Technology
- Privacy
- Security
- Reliability
- Wireless Devices
- Transcoding
- 3-Tier App Architecture
- Back-end Connection

Process

Protection

Platform

INET Delivery Framework
For Healthcare

Scope
Localize
Field
Evaluate

(Adapted from Wickramasinghe and Goldberg, 2006)

Funding Criteria

© Nilmini Wickramasinghe 2015
The Pilot Study

- Non-blinded two arm cross over trial with standard care arm and technology arm.
- Patients recruited when diagnosed with GDM on recommendation of clinician.
- Participation was for 8 weeks and at the end of week 4 cross-over took place.
- Users of the system include - 10 patients, 2 clinicians, 1 diabetic educator, 1 endocrinologist.
Results To Date

• 11 patients recruited, 1 dropped out.
• Without exception all patients preferred the technology solution over standard care solution.
• Many suggestions were given for enhancements and more features.
• Patients appreciated the graphical view but some felt data entry was a little tedious - 4 times a day.
• Clinical team including obstetricians, endocrinologist and diabetic educator enjoyed the benefits of the technology solution.
Clinical Implications
- High user satisfaction from clinicians and patients.
- Better managed GDM which leads to healthier baby and mother.
- Proof of concept and user fidelity established.
- Still to determine longer term far reaching implications.

Healthcare IS Research
- Need to understand the healthcare issue not IS/IT for the sake of IS/IT.
- Need to understand the healthcare space and the interactions of the web of players.
- Move forward in a systematic fashion.
- Identify benefits and deliver to these.
- Be realistic – develop a sustainable solution.
- Be patient and develop small steps to achieve a final goal.
- Remember healthcare is dynamic and build this into the model.

Practice:
- Is as effective on all types of diabetes, and other chronic diseases – is wireless in general an appropriate strategy to facilitate monitoring and management in various healthcare scenarios?
- Es in ehealth (efficiency, extending, education, empowerment, evidence based, enhancing quality, ethics, equality, enabling, encouraging).
- Supports a superior healthcare delivery and proved to cut costs and is sustainable.
- Current studies – Canada, US, China, Indian Sub-Continent, Germany and Australia – truly pervasive.
- Given changes in diagnostic criteria for GDM anticipated 30-50% increase.
- Helped to develop the TB monitoring solution for the Kenya project.