Remote Patient Monitoring: A Mississippi Success Story
Session 264  March 7, 2018
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Conflict of Interest

Michael P. Adcock, FACHE

Has no real or apparent conflicts of interest to report.
Conflict of Interest

Tearsanee C. Davis, DNP, FNP-BC

Has no real or apparent conflicts of interest to report.
Agenda

• Objectives
• The Problem
• The Proposal
• The Methodology
• Findings
• Outcomes
• Future Work
Learning Objectives

- Recognize the need for a collaborative approach to managing chronic disease
- Identify potential barriers to conducting research involving technology as a mode of healthcare delivery
- Evaluate chronic disease management programs using technology in patients home to achieve significant cost savings and reduce readmissions
The Problem

• Mississippi and specifically Sunflower County ranks at the top for the prevalence of diabetes.

• Mississippi continues to rank in the top two for highest prevalence of Diabetes in the nation.

• In 2012, diabetic medical expenses in Mississippi totaled $2.74 billion, according to the American Diabetes Association.
The Problem

• Approximately 371,662 people in Mississippi, or 15.4% of the adult population, have diabetes.

• People with diabetes have medical expenses approximately 2.3 times higher than those who do not have diabetes.

• Diabetes and prediabetes cost an estimated $3.5 billion in Mississippi each year. The serious include heart disease, stroke, amputation, end-stage kidney disease, blindness – and death.
Diabetes Belt

- Southeastern United States
- More likely to have Type 2 Diabetes
- 644 counties in 15 states
Proposal

• Create a sustainable model of care that would assist patients and providers as they manage diabetes

• Use Technology to deliver American Diabetes Association approved education

• Test the effect of a collaborative approach to diabetes management powered by technology on patient outcomes
Partnerships

- Partnerships were formed with key stakeholders. All parties provided services “in-kind” for this project

- These partners met for a year prior to discuss the aims and methodology for the project
Partners
Mississippi Diabetes Telehealth Network

A Collaborative Approach to Health Care Delivery
Research Question

• Does the addition of telehealth services to deliver the ADA standards of care result in a decrease in patients’ hemoglobin A1c measures and have a positive affect on the secondary outcome measures in the population of uncontrolled diabetics?
Purpose:

• To improve clinical outcomes and care coordination for chronic disease management
• Increase access to care
• Bring healthcare resources into the patient’s home
Eligibility

Target number 200

• Inclusion Criteria:
  • Patient at the NSMCSRHC
  • 18 years of age or older
  • Prior diagnosis of diabetes mellitus
  • Not pregnant
  • Hemoglobin A1C greater than or equal to 7% based on prior or current testing at the NSMCSRHC
Sustainable Change: Engaging the Patient

Knowledge  
*Phase 1*

Engagement  
*Phase 2*

Behavior Change  
*Phase 3*

Personal Empowerment  
*Phase 4*
Remote Patient Monitoring

Chronic disease management in the patient’s home including:

- Daily Health Sessions
- Personalized Interventions
- Targeted Education
- Health Coach
- Behavior Modification
- Patient Empowerment

Chronic disease management in the patient’s home including:
# MS Diabetes Telehealth Network

<table>
<thead>
<tr>
<th>HbA1c</th>
<th>Medication Compliance</th>
<th>Health Session Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7%</td>
<td>96%</td>
<td>83%</td>
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</table>

<table>
<thead>
<tr>
<th>Retinopathy Found</th>
<th>Weight Loss</th>
<th>Miles Saved</th>
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</thead>
<tbody>
<tr>
<td>9 cases</td>
<td>71 pounds</td>
<td>9,454.11</td>
</tr>
</tbody>
</table>

No Hospitalizations or ER visits for DM

*Preliminary results on first 100 patients*
MS Diabetes Telehealth Network

How MISSISSIPPI is Leading the Way in {INNOVATION}

**Problem**
- 13% of adults in Mississippi have diabetes
- Diabetes is the 6th leading cause of death in Mississippi
- 54% of population is in rural areas, where access to care and connectivity is limited

**Solution**
- Mississippi Diabetes Telehealth Network
  - Designed to measure the impact of connecting rural diabetics to primary care physicians using a remote care management solution

**Outcomes**
- 1.7% average HbA1c reduction
- Fewer hospitalizations and visits for patients using the system
- Medicaid and state savings to further support telehealth

**Projected Savings**
- $339,184 in savings for the 100 patients enrolled in the Telehealth Medicaid Projects
- $189,145 in savings for the 100 patients overall (based on preliminary results)

**Projected Savings**
- $7,988 in annual savings per patient per year
- 43% of expenses driven by hospital inpatient care
- Health costs are 2.3 times higher than individuals without diabetes

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<table>
<thead>
<tr>
<th></th>
<th>Completed Study</th>
<th>Withdrawn</th>
<th>P value</th>
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<tbody>
<tr>
<td></td>
<td>115 (67.3%)</td>
<td>56 (32.7%)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td>.912</td>
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<tr>
<td>Female</td>
<td>79 (68.7%)</td>
<td>38 (67.9%)</td>
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<tr>
<td>Race</td>
<td></td>
<td></td>
<td>.351</td>
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<tr>
<td>Black</td>
<td>97 (84.3%)</td>
<td>44 (78.6%)</td>
<td></td>
</tr>
<tr>
<td>Whites</td>
<td>18 (15.7%)</td>
<td>12 (21.4%)</td>
<td></td>
</tr>
<tr>
<td>Baseline A1c</td>
<td>9.5 (2.0)</td>
<td>10.1 (2.0)</td>
<td>.084</td>
</tr>
<tr>
<td>Household income(^1)</td>
<td>$35,009 (37,900)</td>
<td>$30,343 (21,874)</td>
<td>.409</td>
</tr>
<tr>
<td>Number in household(^2)</td>
<td>2.6 (1.4)</td>
<td>2.0 (.81)</td>
<td>.414</td>
</tr>
<tr>
<td>Year onset diabetes(^3)</td>
<td>2004 (9.2)</td>
<td>2005 (8.5)</td>
<td>.845</td>
</tr>
<tr>
<td>Age(^4)</td>
<td>53.5 (11.9)</td>
<td>48.5 (11.3)</td>
<td>.009</td>
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</tbody>
</table>

1. Mean (SD) n=104 and n=53 for study completers and withdrawals, respectively.
2. Mean (SD) n=110 and n=4 for study completers and withdrawals, respectively.
3. Mean (SD) n=110 and n=56 for study completers and withdrawals, respectively.
4. Mean (SD)
# Results

HbA1c mean values of five study time-points*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean % (SD)</th>
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<tbody>
<tr>
<td>Baseline**</td>
<td>115</td>
<td>9.5 (2.0)</td>
</tr>
<tr>
<td>3-months</td>
<td>112</td>
<td>7.7 (1.3)</td>
</tr>
<tr>
<td>6-months</td>
<td>112</td>
<td>7.8 (1.3)</td>
</tr>
<tr>
<td>9-months</td>
<td>88</td>
<td>7.9 (1.4)</td>
</tr>
<tr>
<td>12-months</td>
<td>94</td>
<td>7.9 (1.4)</td>
</tr>
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</table>

* p<.001

** Pairwise comparisons indicated that the baseline mean A1c was significantly (p<.001) greater than each of the four subsequent mean A1c values, and no significant differences were found between mean values at 3, 6, 9 and 12 months.
SB 2646 (2104) - SAF; RPM

SENATE BILL NO. 2646
(As Sent to Governor)

AN ACT TO CREATE NEW SECTION 83-9-353, MISSISSIPPI CODE OF 1972, TO REQUIRE
HEALTH INSURANCE AND EMPLOYEE BENEFIT PLANS IN THIS STATE TO PROVIDE COVERAGE
AND REIMBURSEMENT FOR "STORE-AND-FORWARD TELEMEDICINE SERVICES" AND
"REMOTE PATIENT MONITORING SERVICES" TO THE SAME EXTENT THAT THE SERVICES
WOULD BE COVERED AND REIMBURSED IF THEY WERE PROVIDED THROUGH IN-PERSON
CONSULTATION; TO DEFINE "STORE-AND-FORWARD TELEMEDICINE" AND "REMOTE PATIENT
MONITORING"; TO AMEND SECTION 83-9-351, MISSISSIPPI CODE OF 1972, TO INCLUDE
EMPLOYEE BENEFIT PLANS IN THE REQUIREMENT FOR INSURANCE REIMBURSEMENT FOR
TELEMEDICINE SERVICES; AND FOR RELATED PURPOSES.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MISSISSIPPI

http://billstatus.ls.state.ms.us/documents/2014/pdf/SB/2600-2699/SB2646SG.pdf
Lessons Learned

• Smaller Tablet
  – Patients need tablets that are more mobile
• No tethered devices
  – Cords and cables cause confusion and increased technical issues
• Affordable options
  – Blood glucose strips were not affordable
• Connectivity
  – Wireless connectivity limited
  – Provide patients with cellular network connectivity
Future Research

• Larger sample size
• Random assignment of treatment
• Patient and provider satisfaction
• Analysis of cost effectiveness
UMMC’s RPM Plan

- Monitoring for patients across multiple chronic diseases
- Extend to pediatric population
- Significant cost savings
- Extend outside of Mississippi’s borders
- Continue innovative approach to bringing healthcare resources into the patient’s home
Patient Feedback

97% Strongly Agree /Agree
I would recommend this program to others.

99% Strongly Agree /Agree
I feel this is an important step in my care.

93% Strongly Agree /Agree
The equipment was easy to use.

93% Strongly Agree /Agree
If I had a problem, someone was available to help me.
Excellent Medication Compliance

Did you take all of your medications in the past 24 hours?

- 98% “Yes”
- 2% “Missed”

Please tell us why.

- 53% Another Reason
- 29% I Forgot
- 15% I Ran Out
- 3% Side Effects

“Missed”
Remote Patient Monitoring

Current RPM Programs
- Employer based program
- Chronic disease
  - Diabetes (Adult and Peds)
  - Congestive Heart Failure
  - COPD
  - Hypertension
  - Bone Marrow Transplant
  - Kidney Transplant
- High Risk Pregnancy

Future RPM Programs
- Asthma (Adults and Peds)
- Congenital Heart
- Medical Weight Loss
- Neonatal
Questions

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Please complete online evaluation.