Feasibility of Engaging Underserved Diabetes Patients in a Web-based Personal Health Record to Facilitate Care Outcomes:

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Disclosures

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• Meters provided by Johnson and Johnson Lifescan
• A1C-Now+ devices provided by Bayer Healthcare
Chronic medical conditions require self-management and effective, secure communication of PHI across the care continuum.

“eHealth” = use of information & communication technologies to enhance quality & safety of health care (World Health Association 58.28. 2005)

Enables informed individuals to be actively engaged in the daily management of their chronic conditions as “change agents” (Solomon MR. Dis Manage Health Outcomes. 2008;16(391-401)

Current HIE ecosystems do not fully support these needs (RHIO; centralized databases, etc)
## eHealth Technology

<table>
<thead>
<tr>
<th>eHealth technology functions¹</th>
<th>CCM self-management component supported²</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enable storage, retrieval and transmission of data</td>
<td>Problem identification</td>
</tr>
<tr>
<td>To support clinical decision making</td>
<td>Goal setting; Care planning; Problem solving; Self-monitoring</td>
</tr>
<tr>
<td>To facilitate remote care</td>
<td>Self-management education</td>
</tr>
</tbody>
</table>

IT to Support Self-Management (SM) in Chronic Care

- Systematic review of IT to enable consumer SM and provider support of SM
- 28 articles representing 32 studies (53% diabetes studies)
- Adherence and knowledge level most common measures - sig. outcomes; inconclusive clinical outcomes
- Body of research is “immature” in breadth, depth of evidence and rigor of study designs.

Solomon MR. Dis Manage Health Outcomes. 2008;16(391-401)
Theoretical Basis

• Minority race and ethnicity, low socioeconomic or literacy status and advanced age are associated with risk of poor health outcomes (J Med Libr Assoc 2005).

• DM patients must self-manage 95% + of the time. (JAMA 2000)

• Currently patient gathers fragmented data for review at follow-up visits.

• eHealth records have potential to support shift in locus of care to the home, further engaging the patient actively in self-care

• Microsoft® HealthVault provides a patient-centered data hub to enable collection, storage, timely review and sharing of PHI
Moving from Memory to Reliable DATA

Date: Jan 21, 2010

- Metformin HCl 500 mg, in Am, 1:00 PM
- Chlorzoxide XL 5 mg, in Am, 10 PM
- Lisinopril 40 mg, before Breakfast
- Niacin 650 mg, 30 min before Lunch
- Synthroid 0.683 mg, 1 hr after Am
- Potassium Chloride 20 mg, qd
- Norvasc 10 mg, qd
- Effortran 30 mg, qd
- Levothroid 100 mg, 2 AM
- Tropic Nitid 100 mg, qd
- Wizard Rx 80 mg, qd
- Ayeshi 81 mg, qd
- Serevastatin 10 mg, qd
- Diltiazem CR 180 mg, qd
- Calcium + Vit D 1000 mg, 100 mg
- Vit B Complex 60, qd
- Vit B12 1000 mg, qd
- Vit E 400 mg, qd
- Vit A 10,000 IU, qd
- Chlorine 250 mg, qd
- Centrum Silver qd
- Zinco 30 mg, qd
- Fish Oil 360 mg, qd
- Dulseal Softner 2 qd
- Senokot 1 x 1q
- Vit C 1000 qd
- Ginger

Medications

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Strength</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIPITOR</td>
<td>10 mg</td>
<td>10 mg</td>
<td>Daily</td>
</tr>
<tr>
<td>ALENDRONATE SODIUM TABLETS</td>
<td>70 MG</td>
<td>1</td>
<td>Weekly</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>1000 mg Tablet(s)</td>
<td>1000 mg Tablet(s)</td>
<td>Daily</td>
</tr>
<tr>
<td>PIOGLITAZONE HCL ACTOS TABLETS</td>
<td>30 MG</td>
<td>30 MG</td>
<td>Daily</td>
</tr>
<tr>
<td>LISINOPRIL</td>
<td>20 MG</td>
<td>20 MG</td>
<td>Daily</td>
</tr>
<tr>
<td>NOVOLOG FLEXEN PREFILLED SYRINGE</td>
<td>100 UNT</td>
<td>100 UNT</td>
<td>Daily</td>
</tr>
<tr>
<td>Lasix</td>
<td>40 mg</td>
<td>40</td>
<td>Weekly</td>
</tr>
<tr>
<td>ASPIRIN ENTERIC COATED</td>
<td>325 MG</td>
<td>325 MG</td>
<td>Daily</td>
</tr>
<tr>
<td>NIASPAN TABLETS EXTENDED RELEASE</td>
<td>500 MG</td>
<td>500 MG</td>
<td>Daily</td>
</tr>
</tbody>
</table>
Enabling Self-Management

Blood Glucose Report

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Value (mg/dL)</th>
<th>Type</th>
<th>Source</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/22/2011 6:15 AM</td>
<td>62</td>
<td>Before breakfast</td>
<td>ehealth2go</td>
<td>shaky, drank juice</td>
<td></td>
</tr>
<tr>
<td>2/22/2011 12:20 PM</td>
<td>217</td>
<td>Before lunch</td>
<td>ehealth2go</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rationale for Practice

• Many underserved high risk patients are ostensibly separated by a digital divide from access to technology-facilitated healthcare opportunities
  (J Med Libr Assoc. 2005)

• Study to examine whether minority and vulnerable patients with diabetes can successfully adopt a patient-centric, web-based PHR as an HIT tool to enable engagement in DM self-care and promote improvement in health outcomes
Goals

“eHealth2Go” active participants will show:

• Improvement in A1C, BP and LDL-C measures;

• Reduction in hospitalizations, ED visits, and days missed from work for decompensated glycemic control

• Satisfaction with the PHR.
How does this practice address disparities in health care at the community level?

- Provides DC residents an opportunity to ‘cross the digital divide’
- Allows web-based access to PHI 24/7 and wherever it is needed.
- Potential to be interfaced with provider and healthcare facilities and regional health information system databases
Steps in Implementation

- 3 mos non-randomized prospective demonstration project
- Eligibility requirements - diagnosis of diabetes; willing to participate; no prior computer experience needed
- Recruited from the ambulatory care clinic of an urban tertiary care hospital that is located in Ward 5 of the District of Columbia.
- Support provided to create and utilize a PHR
- Encouraged communication with providers
- Utilize partnered devices (blood glucose and blood pressure monitoring devices)
Steps in Implementation

- Informed consent and HIPPA authorization
- Basic computer instruction provided
- Have or establish an email address and MS Live-ID
- Register for an eHealth2go account.
- Supported in entering key lists
- Glucometer and 2 strips for two FSBG daily.
- BG results data entry - manual or via download
- Print out reports of PHI, including BG results for provider visits.
- “Refrigerator” printouts of medication schedules
Welcome to eHealth2Go

- Create and keep your own lifetime medical record
- Track how your health is doing and identify health trends
- Make your health information available “24/7”, when and where it is needed
- Access logs, resources and helpful information for managing your health

Get Started
Sign in

All health records you create through eHealth2Go are stored in Microsoft HealthVault, a security-enhanced service that lets you gather your health records online.

Connects with Microsoft HealthVault
Partners

• Microsoft Be Well Fund Award
• MedStar Institute for Innovation
• GetReal Consulting
• Johnson & Johnson LifeScan - meters
• Bayer - A1C Now test kits
• Chronic Care Initiative grant from the DC Dept of Health for environmental scan of HIE resources available in DC and formulated recommendations for incorporation of a PHR into the District’s HIE plan.
Evaluation Results

• 50 patients enrolled
• 29 have completed the intervention.
• Interim data analysis
• All participants, including those with low computer literacy and the elderly, have successfully established PHRs.
• When compared to baseline
  – A1C average pre-intervention was 9.3% and post-intervention was 7.7%.
  – Average BG was 180mg/dL pre- and 151mg/dL post-intervention.
• 86% of completers reported that they will continue using the PHR post-intervention.
Factors Facilitating Implementation

• Funding from Microsoft Be Well Fund.
• Patient interest in the PHR concept and willingness to take time to enroll and populate their PHR.
• Using glucometer drivers to allow auto-population of data.
• Autopopulation of medication lists, lab results, etc from HealthVault once connectivity interfaces for eHealth2go are established would be expected to facilitate implementation.

“human element”
Health Affairs March 2011
Factors hindering Implementation

• Teaching patients to use a computer and engaging them actively in setting up a PHR takes several hours and requires support from a health team member.

• Manually entering BG data long-term tedious.

• Funding to support dissemination of the project not available this year; plans to pilot a PHR further have been placed on hold as emphasis is being placed on providing electronic medical records and getting the DC-RHIO established.
Sustainability

- All participants have long-term free access to the PHR.
- PHI data remains in HealthVault and can be accessed via the eHealth2go or any one of the other PHRs available in this space.
- Accessed from anywhere with internet.
Expanding Reach of the Practice

Increase uptake and adoption
  – Usability studies DM & other populations
  – Increase auto data population functionalities
  – Mobile platform version
  – Provider viewer

Expand offering to patients
  – MedStar system patients prior to discharge from hospital
  – Seek further partners

Seek evidence supporting clinical impact
  – Projects to further examine impact on A1C, CV risk
Lessons Learned on the PHR “Front-lines”

• Things you think are important may not be (activities logging/choices)
• Things you think are problems may not be (access; computer use)
• Things you think may not be important are (printing reports)
• Things you think may not be problems are (data entry)
Vision:

PHRs as a Promising Practice

• Leverage the individual as a healthcare system change agent
• Utilize the PHR to enable:
  – decreased dependence on memory for storing medical data
  – supports for self-management
  – seamless multidisciplinary team management of chronic conditions

Patients will view medical data the same way they currently view financial data &/or online business transactions
Welcome to eHealth2Go

- Create and keep your own lifetime medical record
- Track how your health is doing and identify health trends
- Make your health information available "24/7", when and where it is needed
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