DiabetesAgent.org:
Development and evaluation of a dashboard to improve diabetes patient appointment efficacy

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Disclosures

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose
Diabetes remains one of the most common chronic diseases in the U.S., affecting over 24 million individuals.

Although our understanding of diabetes management has improved considerably over the past two decades, patient implementation of optimal management lags far behind the ideal.
PPCEs are Suboptimal

Patient-Provider Clinical Encounters (PPCEs) are the key interaction between diabetes patients and their medical support, yet they are often inefficient or ineffective... 

- Patients forget to bring key resources to the provider
- Patients forget questions they wanted to ask the provider
- Patients forget things they discuss with the provider
- Patients are unclear about how to do things provider’s suggest
- Patients and providers lack time to address myriad issues
Improving the PPCE

We asked:

- Can tools be made to address these problems?
- Will patients use such tools and find them beneficial?
Objectives

• To develop and formatively evaluate tools that would assist patients with inter-visit management of their diabetes, especially as it relates to preparing for a clinical encounter and recording and understanding what occurs during the encounter.

• To integrate these tools in a mobile friendly diabetes management support portal, including a dashboard for managing clinical encounters.
Methods

Development

• Iterative, user-centered development processes
• Behavioral change theory
• Extensive input from nationally respected diabetes care experts and healthcare providers

Evaluation activities

• subject-matter-expert review
• mixed-methods single-subject usability sessions
• pilot multi-site efficacy field trial
Results

Created paper-based Patient Appointment Readiness and Patient Visit Journal forms.

Migrated to electronic, interactive versions.

Created video segments and case studies (Real Issues and Real People)

   Topics ranging from medication adherence to glucose monitoring, to lifestyle change.

Integrated into a patient dashboard, mobile friendly
Preparing for the PPCE

1. Have you monitored your glucose since you last visit? 
   □ Yes □ No  Please describe:

2. Have you experienced any low blood sugar events since your last appointment? 
   □ Yes □ No  Please describe:

3. Do you have an up to date list of your medications? 
   □ Yes □ No  If no, please list your current medications and how you take them.

4. Have you had any issues related to your medications since your last appointment? 
   □ Yes □ No  Please describe the issues

5. Do you think your medications are working? 
   □ Yes □ No  Please describe why/why not:

6. Have you experienced any situations where you have not taken your medications as prescribed? 
   □ Yes □ No  Please describe:

7. Have you experienced anything you suspect might be a side effect of the medications you are taking? 
   □ Yes □ No  Please describe:

8. Have you experienced anything unusual or different about your body or health since your last visit? 
   □ Yes □ No  Please describe:

9. Is there anything else you would like to discuss with your health care provider?

Please remember to bring: 
□ this form  □ the diabetes appointment journal
□ your glucose meter and/or logbook or journal  □ your list of current medications
□ any other logs, journals, or notes
Capturing/Debriefing the PPCE

So, you just saw your doctor. Did he/she:

1. Change your medication?
   - Add a new medication? Which medication and how should you take it?
   - Change how you take a medication? Which medication and what is the change?
     - Change time I take it
     - Take with food
     - Reduce dose for a while & build back up
     - Other:
   - Do something that reduces side effects you are experiencing? What should you do differently?

   Notes:

2. Change how you monitor your blood glucose?
   - Test more frequently
     - How frequently?
   - Test at a specific time
     - When?
     - fasting
     - after meals
     - when I take a med
     - bed time
     - before meals

   Notes:

3. Identify new problems you are having with your diabetes?
   - eye disease
   - kidney disease
   - erectile dysfunction (ED)
   - heart disease
   - nerve disease
   - Other:

   Notes about complications or steps discussed to reduce them:

4. Suggest ways to reduce risk/improvement management of your diabetes?
   - Change your diet
   - Quit smoking
   - Increase your physical activity
   - Reduce drinking
   - Reduce/eliminate substance use
   - Other:

   Notes:

Other notes regarding the appointment:
In Between Appointments

We also created some resources to support patients to manage diabetes between visits, including

1. Educational Resources
2. Video-based Case Studies
3. Issue/Question Capturing Tools
Monitoring Glucose

Sore fingers, endless test strips, drops of blood... you might dread or resent monitoring your glucose for these or other reasons. But glucose testing is one of your best allies in your diabetes management. It gives you the up-to-the-minute feedback you need to make excellent choices that make you feel better. Think of this step as the gratification for all the work you’re putting in. Monitoring is still the best way to avoid hypoglycemia and to see how effective your therapy is.

It’s essential to monitor and manage your glucose: good control of blood glucose will prevent significant complications of diabetes that lead to a poor quality of life, or even death. Diabetes is unique – it requires a high degree of patient involvement to get into therapy.

Explore these links and videos to get strategies for optimal glucose monitoring.

Jump to: Videos | Tools & Resources | News

Videos

Gene Monitoring Glucose

Gene discusses how he has chosen not monitor his glucose as often.

Watch Video »

Carlos Monitoring Glucose

No Comments »
Real People: Amber

Amber, 12, was diagnosed with Type 1 diabetes in 2009 when she was nine. She has used her experience with diabetes as a personal journey of education and empowerment for herself and others. Her younger brother was diagnosed with Type 1 several years before she was, when he was two years old, so Amber had a working knowledge of what it might mean to be diagnosed at such a young age.

Since her diagnosis she has embarked on a path of diabetes advocacy through performance. She has written a song about diabetes and a book, which she also illustrated.

Amber’s Activism

Amber uses her book “My New Normal” to spread information about diabetes.

Watch Video »

Amber’s Concerns for the Future

Amber discusses chasing blood sugar perfection and how she handles specific fears about her future.

Watch Video »

Amber Coping with Diagnosis

Amber talks about learning the basics of diabetes care and adjusting to her new condition.

Watch Video »
Priscilla’s Concerns for the Future

Hesitant to Set Goals

Priscilla is hesitant to set goals because she’s afraid she’ll never be able to manage.

Priscilla, 61, was diagnosed with Type 2 diabetes. She’s worried about her struggles with diabetes, depression, and finding treatment that worked for her. She has struggled with finding the right medications, relationships with doctors, losing weight, and changing her dietary habits.

She finally saw changes in her test results when she found medication that worked for her. She finds hope in stories of relatives who lived with diabetes into their 90s.
Evaluation

SME Review—iterative and ongoing

Single subject usability sessions

Field trials

- RCT of 54 adults with diabetes (Type 1 & Type 2)
- Randomly assigned to either exposure to Diabetes Agent or usual care
Sample

54 subjects, mean age: 49.13
- 29 intervention; 25 control

Gender: 31 females, 23 males
- 65% married, 17% single, the rest “other”

Work status: 48% working full time

Income: Median household income; between $50 – 75 thousand

Education:
- 22% HS education
- 27% some college
- 22% college grads
- 27% advanced degree
Utilization

After initial exposure use was relatively low:

- 48% were regular users
- 8% used the system at least twice
- The remaining were sporadic
Usability and Usefulness

• 93% of regular users felt that DiabetesAgent had the right amount of information, activities, and was of appropriate length

• 100% felt the site was credible, accurate, and professional

• 80% felt the site was engaging and 20% that it was somewhat boring

• Overall rating of the site:
  – 28% excellent
  – 50% good
  – 7% fair
## 3 Month Data

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take my medications</td>
<td>53% extremely important 27% very important</td>
<td>100% extremely important</td>
</tr>
<tr>
<td>Changed attitudes about skipping doses</td>
<td>0% not at all 7% somewhat 27% very much 47% extremely</td>
<td>50% not at all 10% somewhat 10% very much 30% extremely</td>
</tr>
<tr>
<td>Perception of self monitoring of BG</td>
<td>15% not at all 46% somewhat 15% very much 15% extremely</td>
<td>44% not at all 33% somewhat 22% very much 0% extremely</td>
</tr>
</tbody>
</table>
Discussion

• DiabetesAgent generally well received and found to be useful and usable, and was actually used.

• Lower than expected utilization
  – Current use is pegged principally to preparing and debriefing from appointments therefore not surprising that use was limited to 1-2 times since 3 mos period typically includes at most 2 clinical visits (one of which was intake for the study)
  – may be enhanced with reminders and more ongoing release of information
  – Longer study period

• No ecologically valid measures
  – As an efficacy trial, we established that a patient readiness dashboard is useful, useable, and would in fact be used, and did lead to changes in attitudes as compared to control
  – However, future studies should include other measures of affect on real world outcome variables such as glucose monitoring, A1C, provider metrics regarding patient engagement and readiness, etc.
Conclusions & Next Steps

✓ Diabetes management is a recalcitrant problem.
✓ Clinical inertia and care continuity gaps can be partially mitigated by activating patients and providing them with relatively simple dashboard-integrated tools.
✓ The two paper and electronic readiness forms and the video case studies were particularly well received.

☐ Need to create more tools to link with patient provided data. Currently, only some questions on forms have associated tools and resources (development limitation).

☐ Need to conduct longitudinal study across many clinical encounters and with ecologically valid measures (evaluation limitations).
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The project may be accessed at diabetesagent.org.