Improving Medical Outcomes Among People with Co-Occurring Diabetes and Serious Mental Illnesses

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Funding

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Substance Abuse & Mental Health Services Administration, Center for Mental Health Services

Cook, 2017
www.cmhsrp.uic.edu/health/index.asp

Cooperative Agreement #H133B100028
Collaborating Organizations & People

- UIC Center on Psychiatric Disability & Co-Occurring Medical Conditions
- UIC College of Nursing, Integrated Health Care Clinics
- Thresholds Psychiatric Rehabilitation Centers
- UIC Eye & Ear Infirmary
- UIC Podiatry Clinic
- Kennedy-King College, Department of Dental Hygiene
- Jessica Jonikas & Pam Steigman
- Joni Weidenaar
- Crystal Glover
- Sue Braun
- Emily Brigell
- Kathy Christiansen
- Kristin Davis
- Katy Dobbins
- Jay Forman
- Ann Heesacker
- Asma Jami
- Sheila O’Neill
- Deborah Pavick
- Robert Laveau
- C.R. Lavallee

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Scope of the Problem

• 10% of people with SMI have diabetes
• Only 1/3 of people with these coexisting conditions receive a diagnosis and treatment
• Relationship is bidirectional: having diabetes increases the risk of mh disorders and having mh disorders increases the risk of diabetes
Project Purpose

- Enhance adherence to ADA standards of care by improving care delivery and coordination
- More effectively link patients to specialty care in accordance with ADA standards
- Tailor patient education & promote diabetes self-management
- Develop new treatment/service resources
- Monitor health indicators and outcomes over time

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**SHARED MECHANISMS?**

**DIABETES & SMI**

Multiple complex mechanisms underlie the association between diabetes mellitus and SMI; these mechanisms include:

- Genetic
- Environmental
- Disease-specific factors
- Treatment-specific factors.

Although antipsychotics are the mainstay of treatment in SMI, a causative link, albeit of uncertain magnitude, seems to exist between antipsychotics and diabetes mellitus.


**DIABETES & DEPRESSION**

Shared biological and behavioral mechanisms, such as

- Hypothalamic-pituitary-adrenal axis activation
- Inflammation
- Autonomic dysfunction
- Sleep disturbance
- Inactive lifestyle
- Poor dietary habits
- Environmental & cultural risk factors

are important to consider in understanding the link between depression and diabetes.

Intervention

**Electronic Diabetes Registry**
- Real-time tracking & reporting of adherence to ADA standards of care

**Patient Education**
- Creating & using tailored diabetes education resources

**Care Coordination**
- Linking clients to mandated specialty care
- Educating pts re: diabetes & self-management
- Enhancing coordination between PCP & MH clinicians

*http://www.cmhsrp.uic.edu/health/medical_home_registry.asp

**Online Diabetes Toolkit**
http://www.cmhsrp.uic.edu/health/diabetes-library-home.asp
Why a Registry?

- One electronic database with data from multiple sources to inform complex disease management
- Immediate focus on managing chronic disease at patient, clinic, & population level
- Useful to multiple parties (clinicians, patients, administrators) to facilitate care delivery

(Ortiz, 2006)
Sample Patient Specific Registry Report

CDEMS Progress Note 305XXXXX IHC North

Conditions | Dx | D/C | Add |
---|---|---|---|
DM-2 | ✓ | | |
Cerebrovascular | | | |
Claudication | | | |
Foot Ulcer | | | |
Heart | | | |
HTN | ✓ | | |
Hyperlipidemi | | | |
Loss of Prote | | | |
Nephropathy | | | |
Neuropathy | | | |
Periph vascul | | | |
Prior Amputat | | | |
Psychiatric | ✓ | | |
Retinopathy | | | |
SelfMonitBG | | | |
Visual Impair | | | |

| Services | LDate | LResult | NDate | NResult | Ref | Dec |
---|---|---|---|---|---|---|
Ankle-brachia | | | | | | |
Callus Debrid | | | | | | |
Cardiology R | | | | | | |
Case Manage | | | | | | |
DAN Screen | | | | | | |
Dental | | | | | | |
Diabetic Foot | 01/10 | Rx for S | | | | |
DM Educ | 10/11 | DM diet | | | | |
DPN Screen | | | | | | |
Employment | | | | | | |
Exer Asmt | 12/11 | 30 min | | | | |
Flu Vac | 10/11 | | | | | |
Foot chk | 09/10 | monofila | | | | |
Foot risk Asm | | | | | | |
Hospitalizatio | 10/11 | pneumo | | | | |
Hospitalizatio | | | | | | |
Mental Health | | | | | | |
Nephrology R | | | | | | |
Nerve Condu | | | | | | |
NutEdu | 04/12 | | | | | |
Orthopedic R | 08/11 | Dr. Rob | | | | |
Pne Vac | 05/09 | | | | | |
Residential St | | | | | | |
Retinal Ex | 10/10 | at UIC | | | | |

Meds | Rx | D/C | Add |
---|---|---|---|
ACE Group | ✓ | | |
AG Inhibitor | | | |
ARB | | | |
ASA | | | |
BP Med | ✓ | | |
Fibr Acid D | | | |
Fish Oil | | | |
Glitazones | | | |
Glyburide | | | |
Insulin | | | |

**NOTE**

Nut Educ: Decrease portion size, limit salty foods and junk food, limit soda and caffeine

NEW NOTE (leave blank if no change)
Sample Patient Report Card

Diabetes Report Card

Your A1C

- Your goal = 6.5 or lower
- Values:
  - Sep-11: 7.5
  - Jan-12: 7.2
  - Feb-12: 7.4
  - Oct-12: 6.3

Your blood pressure

- Your goal = 130 / 80 or lower
- Values:
  - Jun-12: 104/86
  - Jul-12: 128/118
  - Oct-12: 128/93

Your weight

- Your goal = __
- Values:
  - Jun-12: 134.2
  - Jul-12: 129.8
  - Oct-12: 127.6
  - Oct-12: 127.6

Your bad cholesterol

- Your goal if you don't have heart disease = 100
- Your goal if you have heart disease = 70
- Values:
  - Oct-11: 91
  - Feb-12: 94
  - Aug-12: 97
  - Feb-13: 96

Eyes, Teeth, Feet: All checked.
Welcome to our toolkit

It has information to help you better understand your diabetes or pre-diabetes.

Care providers, family members, and other supporters will find it useful too.

Download easy to understand patient education materials written at a 5th grade level.

All materials have been crosswalked with American Diabetes Association care standards.

Claim your power to manage your own diabetes and get the care you need.

WHAT PEOPLE ARE SAYING

“Loved the colorful pictures and easy text. It made education simple and enjoyable for both me and my patient.”
Advanced Practice Nurse

“These education sheets are so warm and inviting. They’re empowering – not intimidating”.
Mental Health Consumer Recovery Director

“I can’t wait to use these with my clients. They’re so much better than what’s out there now. So exciting and new!”
Case Manager
## ADA Standards of Care for Diabetes - click box for related education

<table>
<thead>
<tr>
<th>Standard of Care</th>
<th>What is This? Why is it important?</th>
<th>How Often Should This Be Done?</th>
<th>ADA Recommendations or Treatment Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c Testing</td>
<td>This test shows the average amount of glucose in the blood over the last 2–3 months and indicates if a person’s diabetes is under control.</td>
<td>Test HbA1c every 6 months if the patient is in good control and at least twice a year.</td>
<td>The recommended level is &lt; 7.0% when appropriate for the patient.</td>
</tr>
<tr>
<td>LDL-C Testing or a Lipid Panel</td>
<td>Keeping low density lipid cholesterol (LDL-C) under control is recommended to decrease the incidence of heart attack and strokes. Completion of this test is the most-often used indicator of quality care for persons with diabetes.</td>
<td>LDL-C testing should be done annually. While a fasting lipid profile is the preferred way to test a patient, a non-fasting direct measurement of LDL-C can be performed to determine if treatment for hyperlipidemia is required.</td>
<td>The LDL cholesterol goal is &lt; 100 mg/dL.</td>
</tr>
<tr>
<td>Blood Pressure &amp; Control of B/P</td>
<td>High blood pressure leads to strokes, kidney and heart damage.</td>
<td>Blood pressure should be checked at every visit.</td>
<td>Control hyper tension with ACE/ARB and/or other medication as appropriate. Treat to a blood pressure of &lt; 130/80 mmHg.</td>
</tr>
<tr>
<td>Screening for Kidney Disease or Nephropathy</td>
<td>Several interventions can reduce the risk and slow the progression of renal disease for people who have diabetes.</td>
<td>Perform an annual test to assess urine albumin excretion in type 1 DM patients with a duration of 5 years of diabetes and in all type 2 DM patients upon diagnosis. An annual urine screening for microalbuminuria (ACR) is recommended, if appropriate. Measure serum creatinine (eGFR) at least annually in all adults with diabetes.</td>
<td>Treatment with ACE inhibitors or ARBs should be used in the non-pregnant patient with micro or macroalbuminuria. Referral to a nephrologist may be indicated when nephropathy is present.</td>
</tr>
<tr>
<td>Dilated Retinal Eye Exam</td>
<td>A dilated eye exam can detect early disease, which allows early treatment which is important in an effort to prevent blindness.</td>
<td>A dilated retinal eye exam should be done on an annual basis.</td>
<td>Refer patients with diabetes to an optometrist or ophthalmologist every year or perform dilated retinal exams in your office.</td>
</tr>
</tbody>
</table>
Diabetes Education Library

Use these to better manage your diabetes. If you are a care provider, print them to share with patients or clients.

**Diabetes Basics**
- What is diabetes?
- Understanding A1C
- Why treat diabetes?
- Steps to stay healthy
- What affects blood sugar?
- Signs of high blood sugar
- Signs of low blood sugar
- Diabetes routine care
- Diabetes green, yellow and red zones
- Taking care of your feet
- Taking care of your teeth
- Diabetes passport
- Common diabetes medications
- Menu plan for cold and flu
- Diabetes self management goals
- Meds that increase diabetes risk
- Psychiatric meds and diabetes

**A Healthy Lifestyle**
- Self-management planning
- What is healthy eating?
- Diabetes super foods
- What are carbohydrates?
- How many carbs in a day?
- Using the plate method
- Understanding portion sizes
- Eat more vegetables
- Drink more water
- How much water?
- Eating well on a budget
- Read your food labels
- Fast food alternatives
- Be active!
- Types of exercise
- Motivation to exercise
- What shots do I need?
- Mixing diabetes and alcohol

**Hypertension & Cholesterol**
- Managing high blood pressure
- Low salt foods
- Tips for cutting salt
- Cholesterol facts
- Healthy vs. unhealthy fats
- Tips for cutting fats

**Managing Risks**
- Signs of diabetes emergency
- Bladder and kidney infections
- Diabetic nerve damage
- Tips for kidney health
- Diabetic kidney disease
- Eye disease
- Preparing for a dialated eye exam
- Know the symptoms of hypoglycemia
- Know the symptoms of hyperglycemia
What are Carbohydrates?

Good Carbs come from whole-grain cereals, oatmeal, brown rice, whole-grain bread, fruit, vegetables, and low-fat dairy.

Good carbs
- Are used up more slowly in the body, like whole-grain breads or vegetables
- Are higher in fiber and vitamins
- Are better for your diabetes, since they make your blood sugar go up more slowly
- Give you more energy for longer periods

Bad Carbs come from white sugar, white bread, white rice, soda or pop, alcohol, and candy.

Bad carbs
- Are quickly used up by the body, like white flour and white rice
- Cause blood sugar levels to rise quickly
- Can make your diabetes worse
- Give you energy fast, but then make you crash

Not all carbs are bad for you!
- But, it’s important to choose good carbs as often as possible.
- This will help keep your blood sugar stable.

It’s important to avoid soda or sweetened drinks, alcohol, candy, donuts, & fast or processed foods.
Study time frame

Pre-Intervention Period
24 months
April 1, 2010 – March 31, 2012

Implementation Period
Intervention Introduction
12 months
April 1, 2012-March 31, 2013

Follow-Up Period
Full Intervention
12 months
April 1, 2013-March 31, 2014
## Background Characteristics of Registry Participants at Study Baseline*

<table>
<thead>
<tr>
<th>Background Features</th>
<th>Full Sample (N=179)</th>
<th>North Clinic (N=88)</th>
<th>South Clinic (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>66.5%</td>
<td>68.2%</td>
<td>64.8%</td>
</tr>
<tr>
<td>Race:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>61.8%</td>
<td>46.5%</td>
<td>77.0%**</td>
</tr>
<tr>
<td>White</td>
<td>28.3%</td>
<td>40.9%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Hispanic/Asian/Other</td>
<td>9.8%</td>
<td>11.7%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Age (mean, SD)</td>
<td>51.22 (9.8)</td>
<td>52.46 (9.6)</td>
<td>50.0 (9.8)</td>
</tr>
<tr>
<td>Education:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; High School</td>
<td>30.9%</td>
<td>25.3%</td>
<td>35.8%</td>
</tr>
<tr>
<td>High School Grad</td>
<td>41.9%</td>
<td>50.7%</td>
<td>34.5%</td>
</tr>
<tr>
<td>Some College +</td>
<td>27.2%</td>
<td>20.9%</td>
<td>29.9%</td>
</tr>
<tr>
<td>Diagnosis:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bipolar</td>
<td>19.0%</td>
<td>18.2%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Depression</td>
<td>19.0%</td>
<td>21.6%</td>
<td>16.5%</td>
</tr>
<tr>
<td>Schizoaff/Schizophrenia</td>
<td>62.0%</td>
<td>60.2%</td>
<td>63.8%</td>
</tr>
</tbody>
</table>

*Baseline = April 1, 2010

**At baseline, clinics differed significantly on race with a higher % of African Americans at south clinic (p<.05)
## Clinical Outcomes Pre-Post Intervention

Combined Clinic Comparisons of Pre- & Follow-Up Lab Values (N=179)*

<table>
<thead>
<tr>
<th>Quality Measure</th>
<th>Nadir Value at Pre-Intervention Mean (SD)</th>
<th>Most Recent Follow-Up Mean (SD)</th>
<th>Independent T-Test t, p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1c</td>
<td>8.0 (2.4)</td>
<td>6.9 (1.7)</td>
<td>5.0, p&lt;.001</td>
</tr>
<tr>
<td>LDL</td>
<td>107.4 (34.8)</td>
<td>89.4 (29.9)</td>
<td>4.9, p&lt;.001</td>
</tr>
<tr>
<td>HDL</td>
<td>43.5 (14.5)</td>
<td>44.2 (13.0)</td>
<td>0.4, p=.682</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>173.2 (116.2)</td>
<td>144.2 (84.8)</td>
<td>2.4, p=.015**</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>182.0 (42.6)</td>
<td>165.4 (37.8)</td>
<td>3.6, p&lt;.001</td>
</tr>
<tr>
<td>Cholesterol/HDL</td>
<td>4.5 (1.6)</td>
<td>3.9 (1.3)</td>
<td>3.5, p=.001</td>
</tr>
<tr>
<td>Triglycerides/HDL</td>
<td>4.4 (3.6)</td>
<td>3.4 (2.4)</td>
<td>2.7, p&lt;.008***</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>133.4 (19.7)</td>
<td>122.2 (17.4)</td>
<td>5.7, p&lt;.001</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>85.0 (12.7)</td>
<td>77.0 (9.4)</td>
<td>6.8, p&lt;001</td>
</tr>
</tbody>
</table>

*Pre-Intervention period = April 1, 2010 – March 31, 2012; Follow-Up period = April 1, 2013 – March 31, 2014

**In sub-analysis, statistically significant decrease in triglycerides was present for only the North clinic

***In sub-analysis, statistically significant decrease in triglycerides/HDL ratio was present for only the North clinic
Clinical Outcomes for Patients with Very Poor Pre-Intervention Lab Values

Patient-level Within-Subjects Comparison of Pre- & Follow-Up Lab Values

<table>
<thead>
<tr>
<th>Clinical Standards</th>
<th>Nadir Value at Pre-Intervention (%)</th>
<th>Most Recent Follow-Up (%)</th>
<th>Paired T-Test t, p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1c&gt;=10% (N=33)</td>
<td>12.2%</td>
<td>8.6%</td>
<td>6.84, p&lt;.001</td>
</tr>
<tr>
<td>LDL&gt;=160 (N=15)</td>
<td>177.1</td>
<td>126.7</td>
<td>5.46, p&lt;.001</td>
</tr>
<tr>
<td>Total Cholesterol &gt;=240</td>
<td>271.2</td>
<td>189.2</td>
<td>6.32, p&lt;.001</td>
</tr>
<tr>
<td>(N=14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic BP&gt;=160 (N=19)</td>
<td>170.8</td>
<td>133.7</td>
<td>8.82, p&lt;.001</td>
</tr>
<tr>
<td>Diastolic BP&gt;=100 (N=23)</td>
<td>105.6</td>
<td>82.8</td>
<td>8.42, p&lt;001</td>
</tr>
</tbody>
</table>
Pre-Post Comparisons of Diabetes Responder Rate: Meeting 3 ADA Standards
A1c<7, LDL<100 and BP<140/90*

Patient-Level Within-Subjects Comparison of Pre- & Follow-Up Responder Rates (N=128 pairs)

<table>
<thead>
<tr>
<th></th>
<th>Nadir Value at Pre-Intervention (%)</th>
<th>Most Recent Follow-Up (%)</th>
<th>Paired T-Test t(DF), p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responder Rate</td>
<td>9.2%</td>
<td>39.2%</td>
<td>7.23(152), p&lt;.001</td>
</tr>
</tbody>
</table>

Pre-Post Changes in Completed Specialty Care Appointments (N=179)

<table>
<thead>
<tr>
<th>Type of Care</th>
<th>Completed Referrals During Pre-Intervention % (N)</th>
<th>Completed Referrals During Follow-Up % (N)</th>
<th>Chi-Square p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental</td>
<td>3.5 (6)</td>
<td>16.8 (29)</td>
<td>16.815, p&lt;.001</td>
</tr>
<tr>
<td>Optometry</td>
<td>23.1 (40)</td>
<td>33.3 (58)</td>
<td>4.464, p=.023</td>
</tr>
<tr>
<td>Podiatry</td>
<td>17.2 (30)</td>
<td>27.6 (48)</td>
<td>5.354, p=.014</td>
</tr>
</tbody>
</table>

Care coordination was effective in helping to improve the specialty care referral completion rate. Between the pre-intervention and follow-up time points:

- completed dental referrals increased by 380%
- completed optometry referrals increased by 44%
- completed podiatry referrals increased by 60%
Observations

- Disease registries can focus immediate attention on the needs of patients who most require intensive & coordinated care.

- Integrated patient education, health literacy, and illness self-management training are 3 critical promotion and prevention approaches.

- Care coordination can enhance medical & behavioral health management while promoting adherence to standards of care.

- Usefulness of easily accessible patient education materials geared to the needs of people with serious mental illness.
Contact Information

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http://www.cmhsrp.uic.edu/health/

Online Diabetes Toolkit
http://www.cmhsrp.uic.edu/health/diabetes-library-home.asp