

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

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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



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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

Cook, 2017 www.cmhsrp.uic.edu/health/index.asp Melville, 2014; Dixon & Wohlheiter, 2003

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



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.

Nat Rev Endocrinol. 2015 Feb;11(2):79-89. doi: 10.1038/nrendo.2014.203. Epub 2014 Dec 2. Diabetes Care 2014 Aug; 37(8): 2067-2077. http://dx.doi.org/10.2337/dc13-2134

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/diabeteslibrary-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



Cook, 2017

Sample Patient Specific Registry Report

Data (mmdd	La ex E	ast V	isit 1/12	This Visit		CDE	ms	Progre	ss	No	te 305X	xxx	Х	IHC N	lorth		
Date (mmody	y)	04/1	1/12	└┼┦└┾┨┾┿	LN	в				_	EN Willie			DOB 1	962	Sex N	Π
Weight (pds)		2	16	pds	Ade	iress N(California	Ave: Chicago)		Phone	(773) X	XX-XX	Age 49	<u> </u>	BMI 3	3.8
Height (inche	s)	17	70	inches	PLa	nguage	sion lano	uage Ethni	city	Black	PCP	(110)10		Migrant	U Hom	eless	U
BP-Sys/Dia1	9 15	4 /	74		Oth	er			ony -		101		l	angrant	0		Ĩ
Conditions	Dx	D/C	Add	Services	LDate	LResult	NDate	NResult	Ref	Dec	Labs	LDate	LResul	t NDate	NResult	Ref	Dec
DM-2	~			Ankle-brachia							HbA1c	04/12	6				
Cerebrovascu				Callus Debrid	03/11	Dr. Rob					ALT (SGLT)	12/09	26				
Claudication				Cardiology R							AST (SGOT)	12/09	22				
Foot Ulcer				Case Manage							eGFR	06/11	91.9				
Heart				DAN Screen							EKG	01/11	NSR				
HTN		П		Dental							Glucose	04/12	85				
Hyperlipidemi				Diabetic Foot	01/10	Rx for S					MiAI/Crea rati	06/11	71				
Loss of Prote		н	н	DM Educ	10/11	DM diet					Ser. Creatinin	06/11	1.1				
Nephropathy				DPN Screen							Cholesterol	06/11	144				
Neuropathy		H		Employment							HDL	06/11	27				
Perinh vascul		H		Exer Asmt	12/11	30 min					LDL	06/11	90				
Prior Amountat		님		Flu Vac	10/11						Triglyceride	06/11	133				
Prior Amputat		님		Foot chk	09/10	monofila											
Psychiatric	~	Ц		Foot risk Asm													
Retinopathy				Hospitalizatio	10/11	pneumo											
SelfMonitrBG				Hospitalizatio													
Visual Impair				Mental Health													
Meds	Rx	D/C	Add	Nephrology R													
ACE Group				Nerve Condu													
AG Inhibitor	믬	н	н	NutEduc	04/12												
ARB	님	H		Orthopedic R	06/11	Dr. Rob											
ASA	님			Pne Vac	05/09												
ASA DD Mad	느			Residential St													
BP Med	~			Retinal Ex	10/10	at UIC											
FIDRIC ACID				SM Goal													
Fish Oil				NOTE Nut	Educ: D	ecrease p	ortion siz	e. limit salty fr	oods :	and in	ink food, limit se	da and i	caffeine				٦
Glitazones					2000.0	concase p		a, mine song h		and Je	and ready form Se						
Glyburide																	
Insulin				NEW NOTE (k	eave bla	nk if no ch	ange)										-

Sample Patient Report Card





Center on Psychiatric Disability and Co-Occurring Medical Conditions UNIVERSITY OF ILLINOIS AT CHICAGO Psychiatr COLLEGE OF ME Toolkit Patient Education ADA Standards Podcasts How to Use the Toolkit Contact Us Hom Diabetes Education Toolkit Welcome to our toolkit It has information to help you better WHAT PEOPLE ARE SAYING understand your diabetes or pre-diabetes. Care providers, family members, and other "Loved the colorful pictures and easy text. It supporters will find it useful too. made education simple and enjoyable for both me and my patient." Download easy to understand patient Advanced Practice Nurse education materials written at a 5th grade level. "These education sheets are so warm and inviting. They're empowering - not intimidating". All materials have been crosswalked with Mental Health Consumer Recovery Director American Diabetes Association care standards. "I can't wait to use these with my clients. They're Claim your power to manage your own so much better than what's out there now. So diabetes and get the care you need. exciting and new!"

Case Manager

UIC Departme

ADA Standards of Care for Diabetes - click box for related education

STANDARD OF CARE	WHAT IS THIS? WHY IS IT IMPORTANT?	HOW OFTEN SHOULD THIS BE DONE?	ADA RECOMMENDATIONS OR TREATMENT GOALS
HBA1-C TESTING	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.	Test HbA1c every 6 months if the patient is in good control and at least twice a year.	The recommended level is < 7.0% when appropriate for the patient.
LDL-C TESTING OR A LIPID PANEL	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.	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.	The LDL cholesterol goal is < 100 mg/dL.
BLOOD PRESSURE & CONTROL OF B/P	High blood pressure leads to strokes, kidney and heart damage.	Blood pressure should be checked at every visit.	Control hyper tension with ACE/ARB and/or other medication as appropriate.Treat to a blood pressure of < 130/80 mmHg.
SCREENING FOR KIDNEY DISEASE OR NEPHROPATHY	Several interventions can reduce the risk and slow the progression of renal disease for people who have diabetes.	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.	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.
DILATED RETINAL EYE EXAM	A dilated eye exam can detect early disease, which allows early treatment which is important in an effort to prevent blindness.	A dilated retinal eye exam should be done on an an annual basis.	Refer patients with diabetes to an optometrist or ophthalmologist every year or perform dilated retinal exams in your office.

ADA Standards

D-Occurring Medical Conditions

How to Use the Toolkit

Diabetes Education Library

Podcasts

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

Diabetes Basics

Toolkit

- 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

Patient Education

- 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

Contact Us

Home

- 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

Sample from Patient Education Library

What are Carbohydrates?

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

UNIVERSITY OF ILLINOIS AT CHICAGO Health Care

COLLEGE OF NURSING

Bad Carbs

come from white sugar, white bread, white rice, soda or pop, alcohol, and candy. Carbohydrates are an important source of energy for our bodies. Good carbs are part of a healthy diet.

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

- ⇒ 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
- $\Rightarrow\,$ 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.

UIC Center on Psychiatric Disability and Co-Occurring Medical Conditions, 2013. Material adapted from: http://kidshealth.org/parent/growth/feeding/sugar.html.

Study time frame



Background Characteristics of Registry Participants at Study Baseline*

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

*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)*

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

*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

Clinical Standards	Nadir Value at Pre-Intervention (%)	Most Recent Follow-Up (%)	Paired T-Test t, p-value
A1c>=10% (N=33)	12.2%	8.6%	6.84, p<.001
LDL>=160 (N=15)	177.1	126.7	5.46, p<.001
Total Cholesterol >=240 (N=14)	271.2	189.2	6.32, p<.001
Systolic BP>=160 (N=19)	170.8	133.7	8.82, p<.001
Diastolic BP>=100 (N=23)	105.6	82.8	8.42, p<001

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)

	Nadir Value at Pre-Intervention (%)	Most Recent Follow-Up (%)	Paired T-Test t(DF), p-value
Responder Rate	9.2%	39.2%	7.23(152), p<.001

*Yu, G. C., & Beresford, R. (2010). Implementation of a Chronic Illness Model for Diabetes Care in a Family Medicine Residency Program. *Journal of General Internal Medicine*, *25*(Suppl 4), 615–619. doi:10.1007/s11606-010-1431-9

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

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

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 selfmanagement 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/he alth/diabetes-library-home.asp

